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Faculty perceptions of the undergraduate mentoring process in the College of Agriculture at Iowa State University

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Faculty perceptions of the undergraduate mentoring process in the College of Agriculture at Iowa State University

by

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ABSTRACT

Research on mentoring in educational settings has traditionally focused on faculty and graduate student mentoring, while it has been somewhat less prevalent at the undergraduate level. Literature indicates that while undergraduate academic achievement and career development are undoubtedly influenced by a variety of factors, mentoring is a significant variable. However, faculty and administrators alike are often uncertain about how to foster effective mentoring relationships with undergraduate students. The few undergraduate research studies on mentoring that have been conducted have focused primarily on the protégé's perceptions about their mentor or mentoring relationship. The lack of research regarding faculty perceptions of mentoring continues to leave faculty mentors uneducated about how to foster valuable mentoring experiences with undergraduate students.

The purpose of this study was to determine the perceptions of the faculty in the College of Agriculture at Iowa State University regarding the undergraduate mentoring process. The accessible population consisted of 378 faculty members. Findings were based on data, obtained through a web-based survey, from 200 (52.9%) faculty members. Non-response error was controlled, and the findings may be generalizable across the population.

The results of this study, coupled with the literature on mentoring, indicated that the faculty members in the College of Agriculture at Iowa State University were somewhat unfamiliar with the mentoring process. Though respondents appeared to be appropriately practicing the six mentoring functions presented in the Brzoska, Jones, Mahaffy, Miller, and Mychals (1987) Mentor Function Model, there was evidence that the respondents may have been confusing the roles of an academic advisor and teacher with a mentor, resulting in them being unaware of proper mentoring conduct. Further, the definitions provided by the

respondents in this study continued to support a major finding of past mentoring studies: there appears to be no single, precise definition of mentoring.

Ultimately, the results of this study brought greater awareness of the mentoring functions and descriptors of undergraduate mentoring to college and university faculty. College and university departments can benefit from addressing the findings and the recommendations of this study in the development and delivery of undergraduate mentor training workshops or faculty seminars. Proper training may improve the mentoring provided to undergraduate students, thus increasing the potential for greater academic achievement and career development.

CHAPTER I. INTRODUCTION

Mentoring occurs in many different program settings and many different formats for many different reasons. Programs such as the Big Brother/Big Sister mentor youth on drug and alcohol abuse, peer pressure, violence, depression, and suicide. Other programs provide academic tutoring or career exploration guidance (Smink, 1999). Regardless of the purpose of a specific mentoring program, a mentor has commonly been described as a coach, a guide, a counselor, a role model, a peer advisor, and/or a sponsor (Stanley & Lincoln, 2005). Furthermore, most mentors have an ultimate goal of making a positive influence (Smink). This goal and the plethora of terms used to describe a mentor would suggest that something is known about the role a mentor plays, but most mentoring research has focused on the benefits of mentoring, rather than the specific mentoring functions (Fagenson-Eland, 1989; Scandura, 1992; & Chao, 1997). The lack of research on mentoring functions leaves mentors uneducated about mentoring (Hudson, 2005), often fostering negative mentoring experiences.

Additionally, most of the research on mentoring has been conducted in business and industry rather than in education (Fagenson-Eland, 1989; Scandura, 1992; & Orpen, 1995). Though mentoring has traditionally been associated with higher education, particularly faculty to graduate student mentoring (Merriam, Thomas, & Zeph, 1987; Anderson, Dey, Gray, & Thomas, 1995), it has been somewhat less prevalent at the undergraduate level. The few undergraduate mentoring studies that have been conducted focused on the protégés' perceptions about their mentor or mentoring relationship (Anderson et al.; McCarthy & Mangione, 2000; Van Ast & Field, 2005) and not on the mentors' perceptions. In fact, faculty and administrators are often uncertain about how to foster effective mentoring relationships with undergraduates (Stanley & Lincoln, 2005).

Early mentoring researchers have verified there is a wide range of mentoring functions, or roles, a mentor should practice (Levinson, Darrow, Klein, Levinson, & McKee, 1978; Kram, 1980). Brzoska, Jones, Mahaffy, Miller, and Mychals (1987) developed a model of six Mentor Functions: 1) Informal Contact, 2) Role Modeling, 3) Direct Assistance, 4) Demonstration, 5) Observation and Feedback, and 6) Professional Development Planning Assistance. Mentoring functions have been described as "essential characteristics that differentiate developmental relationships from other relationships" (Kram, 1985 p. 22). Kram (1980, 1983, 1985) further explained that a mentor relationship with the correct mentoring functions has the potential to enhance career development and psychosocial development of both individuals. A mentoring relationship that only provides a few functions is characterized by Kram (1983) as having "little intimacy and weak interpersonal bonds" (p. 23), and are viewed as detrimental to both career and psychosocial development.

Some might argue that "dysfunctional mentoring" is a "low-based rate phenomenon" (e.g. poor relationships occur less often than good relationships) (Scandura, 1998, p. 451). However, parallel to what Kram reported, the consequences of poor mentoring relationships can be serious. Findings from Eby, McManus, Simon, and Russell (2000) showed that protégés perceived that poor interpersonal skills and lack of competency on the mentor's part was to some degree the origin of the negative mentoring experiences. Protégés reported neglect and little to no support or feedback.

Similarly, after Edwards and Protheroe (2004) reviewed their previous studies, they stressed a concern for studying the feedback that a mentor gives a protégé. They argue that mentors are merely just doing what is required of them, and are focusing feedback on "descriptive reiterations" of observed events. For example, in Edwards and Ogdens' (1998)

study involving cooperating teachers and student teachers, one mentoring teacher gave the following remarks to a student teacher after a day's lesson:

> You recapped scientific knowledge, you teased out some of the key scientific vocabulary so they illustrated that they know certain words and were using them correctly and you led into what they were doing and then you used the structured sheet, sort of predicting. (Edwards & Ogden, 1998, p. 742)

This type of feedback is strongly discouraged because it does not identify what needs to be improved, nor if any of the protégé's actions were actually correct (Edwards & Protheroe, 2004). As Elliott and Calderhead (1993) discovered during interviews with mentoring teachers, [this type of] "support … was not geared at 'fostering growth'" (p. 42).

Therefore, one would think a solution to negative mentoring experiences would be to educate mentors on explicit mentoring practices (Gaston & Jackson, 1998). However, in recent decades, colleges and universities have developed training programs for faculty members based on topics such as grant writing, laboratory management, and classroom teaching, but mentoring themes were virtually absent. Until recently, only a few programs, such as the one evaluated in Van Ast's and Field's 2005 study, have been developed. In their study, they reported that faculty mentors who participated in an eight-hour, in-service workshop titled, "How to be a Mentor," received student satisfaction ratings that were consistently higher than those mentors who did not attend the workshop. The sufficient differences in student responses support that the mentoring workshop positively impacted student evaluations of mentors. Though the study implied that the mentors were "educated" and rated "successful," it is unknown which elements discussed at the workshop were actually practiced by the mentors before attending the workshop. Consequently, researchers have been unsuccessful in determining the "effectiveness" or "successfulness" of mentors

because little is known about mentors' existing knowledge of the mentoring process and what mentoring functions they are already practicing. Determining the mentoring elements currently practiced by mentors would aid in identifying those specific mentoring functions that claim to make a mentor "successful" at mentoring.

Statement of the Problem

Literature indicates that mentoring has the potential to enhance student learning. However, the lack of mentoring research at the undergraduate level leaves faculty uneducated about mentoring. Therefore, more information about the mentoring process and its mentoring functions at the undergraduate level is needed. Specifically, identifying and describing how mentoring is currently practiced by faculty mentors will provide insight on what they know about mentoring and how they practice mentoring.

Purpose and Objectives

The purpose of this study was to determine the perceptions of the faculty in the College of Agriculture at Iowa State University regarding the undergraduate mentoring process. The objectives of this study were to:

1. Describe demographic characteristics of the faculty participants.
2. Determine faculty perceptions about mentoring.
3. Determine the mentoring functions practiced and the extent to which they are practiced by faculty in the College of Agriculture.
4. Compare the mentoring functions practiced among selected demographic variables.

Need for the Study

Theoretically, the findings of this study begin to fulfill the need of more mentoring research at the undergraduate level (Anderson et al., 1995). Previous research has concluded that definitional and theoretical model "deficiencies" hinder the usefulness of existing undergraduate mentoring research (Jacobi, 1991). These deficiencies combined with the scant amount of research focused on individual mentoring functions (Hudson, 2005), has provided possible motives for the model used in this study to be adapted to the undergraduate mentoring process.

Implications and Educational Significance

The findings of this study could be of interest to current and future faculty at research colleges and universities, specifically Iowa State University. As stated in Iowa State University's strategic plan,

> The university is committed to continuously evaluating, improving, and evolving programs, as well as exploring and innovating new areas of inquiry and application in order to strengthen undergraduate, graduate, and professional education and enhance student success at Iowa State University and beyond (Iowa State University, 2005_a).

To continue this mission, determining what faculty know about mentoring and which specific mentoring functions they practice, a deeper understanding of appropriate undergraduate mentoring can be achieved.

Identifying strengths and weaknesses in the undergraduate mentoring process will be beneficial both in the long-term and short-term in improving the mentoring process practiced by faculty. Specifically, having a better understanding of the mentoring process can aid college and university departments in the development and delivery of training workshops or informative seminars about the undergraduate mentoring process. For example, agricultural

education faculty might benefit from the findings of this study because they mentor future teachers of secondary agricultural education programs. These students may benefit from a superior mentor by modeling similar mentoring strategies when working with agricultural education students, FFA members, and Supervised Agricultural Experience (SAE) programs.

Definition of Terms

The following terms were defined for use in this study:

College of Agriculture – A division of an established university, dedicated to teaching, research, and extension of agricultural, food, and natural resource issues as well as focusing on undergraduate and graduate education, scholarship, service and leadership in food, agricultural, environmental, and social sciences (Iowa State University, 2005_c).

Faculty – A body of teachers and instructors at an established university. For this study, faculty were the 2006 College of Agriculture faculty at Iowa State University.

Mentor – A person, usually older and more experienced (Levinson et al., 1978), that has an interest and takes action in providing advice and support (Fagenson, 1989), and guiding and fostering progress (Moses, 1989) of a younger, less experienced person (Smink, 1999) in an academic, social, or career setting. For this study, mentors were the 2006 Iowa State University faculty in the College of Agriculture.

Mentoring Functions - The essential characteristics of a developmental relationship that have the potential to enhance career development and psychosocial development of both mentorship individuals (Kram, 1980, 1983, 1985). In this study, functions of mentors will be determined by the perceptions of participants regarding the extent to which the functions in the Brzoska et al. (1987) Mentor Function Model are practiced by College of Agriculture faculty.

Mentoring Program – a system of procedures or activities with established goals and objectives (Smink, 1999) in which a mentor provides a student protégé with guidance, advice, encouragement, and opportunities while emphasizing academic, career, and personal development.

Perception – A personal judgment or opinion of an issue, activity, approach, or practice.

Protégé – A person who receives guidance, training, and support regarding academics, social, or career aspects from a mentor (Fagenson, 1989; Levinson et al., 1978; Moses, 1989; Smink, 1999). In this study, a protégé is considered a student in the College of Agriculture at Iowa State University.

Science With Practice - A program designed to provide opportunities for students in agriculture at Iowa State University to learn while working together with faculty/staff mentor in university research laboratories, farms, greenhouses, and other units that enhance education and work experience (Retallick, Steiner, Stull, 2005).

Undergraduate Mentoring Process – The construction of a one-on-one learning relationship between a mentor (usually a faculty member, staff member, or graduate student) and a protégé (an undergraduate student) that consists of formal and informal aspects, and is based on modeling behavior and extended dialogue regarding academics and career development (Lester & Johnson, 1981).

CHAPTER II. LITERATURE REVIEW

This chapter discusses the literature related to mentoring and presents a rationale and conceptual framework for this study. The chapter is divided into six sections: Mentoring Concept, Mentoring Phases, Mentoring Functions, Mentoring Outcomes, Adaptations of the Mentoring Functions Model, and Mentoring and Undergraduate Education. The first section also provides the conceptual framework for this study. The origin of mentoring is discussed along with an explanation of mentoring from the perspective of three different disciplines - education, management, and psychology. The second, third and fourth sections describe the research related to mentoring phases, functions, and outcomes, respectively. The fifth section explains the adaptations of the original Mentor Function Model and illustrates the Mentor Function Model used in this study. Finally, undergraduate education mentoring research is discussed providing additional support for the need of this study. The chapter concludes with a summary of the literature.

Mentoring Concept

The origin of the term "mentor" is actually quite old. Dating as far back as 3000 years, Homer's *Odyssey* (Butcher & Lang, 1890), an epic poem from Ancient Greece, is frequently cited as the original source for the concept of mentoring. The story began when the king, Odysseus, leaves on a voyage for the Trojan War. During his absence, Odysseus entrusted the care of his kingdom, Ithaca, and of his then infant son, Telemachus, to an old friend, Mentor (Butcher & Lang). The term "protégé" was derived from the past participle of the French verb "proteger", which means one under the care and protection of another (Auster, 1984).

Current literature has explored and described mentoring in several directions including the phases of mentorships (Kram, 1983, 1985; Levinson, 1978), mentoring functions (Noe, 1988; Fowler & O'Gorman, 2005), and the outcomes of mentorships (Chao, 1997; Scandura, 1998). Mentoring research has also occurred in many different disciplines. Studies have been done in organizational or career settings such as business and management positions (Scandura 1998; Fagenson-Eland, Marks, & Amendola, 1997); in first-year teacher settings (Edwards & Protheroe, 2004); in youth programs such as Big Brother/Big Sister (Smink, 1999); and a few have been done in university settings involving undergraduate students and faculty (Anderson et al., 1995 and Retallick, et al., 2005).

Mentoring has evolved and developed in many different disciplines resulting in diverse definitions of mentoring. Jacobi (1991) identified fifteen different definitions of mentoring within three different disciplines; education, management, and psychology. For example, a definition from the management/organizational field was [A mentor is] "someone in a position of power who looks out for you, gives you advice, brings your accomplishments to the attention of other people who have power in the company" (Fagenson, 1989, p. 312). A definition from the education field was "Ideally, a professor takes an undergraduate or graduate student under his or her wing, helps the student set goals and develop skills, and facilitates the student's successful entry into academic and professional circles" (Moses, 1989, p. 9). Levinson et al. (1978) provided the first, most complete description of mentoring from the psychology field. A mentor was described as one who "takes a younger man under his wing, invites him into a new occupational world, shows him around, imparts his wisdom, cares, sponsors, criticizes, and bestows his blessings" (p. 23). The Levinson et al. perspective

of a mentor incorporated a variety of aspects of a protégé's life and did not focus on one alone.

Recent literature has helped define the term "mentor" as one who helps guide a protégé through a developmental process, whether it's a transition from childhood to adulthood or from student to professional (Brzoska et al., 1987). Considering the varying tasks needed to aid in such a transition, a mentor is often referred to as a teacher, a counselor, a friend, a coach, or a role model. Building on this idea, Kram (1985), defined mentoring as the process where a "developmental relationship" evolves in which "a more advanced or experienced person (a mentor) provides career and/or personal support to another individual (a protégé)" (p. 2).

Mentoring Phases

Throughout the1980s, Kram was the pioneer in mentoring research, focusing primarily on the development of the relationship between a mentor and a protégé. The mentoring relationship is theorized to evolve through several stages over time (Kram, 1983). The phases were derived from Kram's 1983 study in which she interviewed eighteen pairs of managers of the same organization about their mentoring relationship. Four evident phases emerged: the initiation phase, the cultivation phase, the separation phase, and the redefinition phase (Kram, 1985).

The initiation phase is the period lasting six months to a year when the relationship between mentor and protégé is beginning. During this phase when "dreams" of both the mentor and protégé become concrete expectations (Kram, 1983), a mutual line of admiration and respect begin to develop. These characteristics set the relationship in motion and provide a foundation for the next phase.

The second phase is the cultivation phase. In this phase, estimated to last two to five years, the mentorship partners continue to learn more about each other, and the frequency of interaction increases. Though disappointment occurred for some, Kram (1985) found that this phase was generally positive. The mentors usually reached maximum satisfaction because they realized the positive influence they were having on someone, and the protégé became more confident and competent as the expectations were being accomplished.

When a promotion of the protégé occurred, or when a sense of independence by the protégé takes over, the third phase, the separation phase, begins. This phase may last between six months to two years and is often considered emotionally stressful to one or both mentorship partners (Kram, 1985). Great feelings of loss or hostility often disrupted the positive interaction.

However, Kram (1985) found that the stresses of the separation phase diminish when a new relationship is formed. When the mentorship partners recognize that the previous relationship form is no longer needed, the final phase, the redefinition phase, begins. Kram (1985) described the relationship turning into more of a "peer-like friendship" where gratitude and appreciation are abundant. This phase of the relationship is an infinite period where the new friendship and memories of the old relationship exist.

In support of Kram's mentoring phase model, Levinson et al. (1978) described the mentorship phases as a love relationship.

> Like all love relationships, the course of a mentor relationship is rarely smooth and its ending is often painful. . . . After the relationship has been terminated, both parties are susceptible to the most intense feelings of admiration and contempt, appreciation and resentment, grief, rage, bitterness and relief – just as in the wake of any significant love relationship (Levinson et al., 1978 p. 334).

In 1983, Schockett, Yosimura, Beyard-Tyler, and Haring, incorporated elements of Kram's mentoring phases into a Network Mentoring Model for higher education (Figure 1). In the initiation phase, the mentor provides education and encouragement, while acting as a role model, coach or consultant for the protégé. The mentor's subsequent undertaking of the sponsoring function marks the beginning of the cultivation phase. Similar to Kram's thoughts, the relationship during the cultivation phase grows and the mentor sponsors, protects, and counsels the protégé. As evident in the model, the behaviors of the mentor begin waxing and waning towards the onset of the separation phase (Schocekett et al., 1983). During the separation phase, the mentor and protégé begin to psychologically disengage. By the time the mentoring relationship reaches the redefinition phase, the mentor is moving from a "transitional figure to a friend".

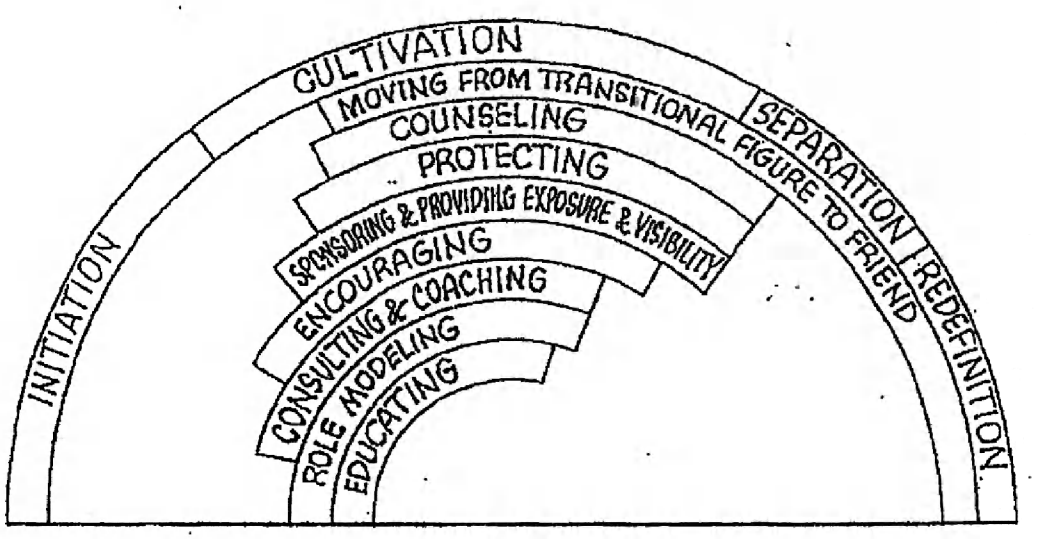

Figure 1. Schocekett et al. (1983) Model of Mentoring

The mentor phase model demonstrated by Kram (1983) and Schocekett et al. (1983) does not only characterize the particular events experienced in each phase, but it also associates different functions within each phase (e.g. role modeling, sponsoring, and

counseling). According to Choa (1997), understanding mentoring phases helps determine how a mentor and protégé will interact as the relationship develops, and theoretically, the phases identify the roles to be played by mentors and protégés.

Mentoring Functions

As mentioned earlier, Kram (1985) described mentoring functions as "essential characteristics that differentiate developmental relationships from other relationships" (p. 22). Early research studies on mentoring relationships indicated a wide range of mentoring functions or roles (Kram, 1980; Levinson et al., 1978). Kram (1980, 1983, 1985) found that a mentor relationship has the potential to enhance career development and psychosocial development of both individuals. Within these findings, she identified two broad categories of mentoring functions: career and psychosocial functions (Kram, 1985) (Table 1).

Table 1. Mentoring Functions

CAREER FUNCTIONS	PSYCHOSOCIAL FUNCTIONS
Sponsorship	Role Modeling
Exposure-and-Visibility	Acceptance-and-Confirmation
Coaching	Counseling
Protection	Friendship
Challenging Assignments	

Career functions are those aspects of the relationship that are directly associated with protégé career advancement. Kram explained that career functions "assist the protégé in learning the ropes of the organizational life and in preparing for advancement opportunities" (1985, p. 23). Psychosocial functions involve aspects that affect each mentorship partner on a

more personal level. These functions enhance the sense of competence, identity, and effectiveness in a professional role.

Functions for each category allow the mentorship partners to embark upon the challenges of each relationship phase. Kram (1985) discovered that career functions emerge during the initiation phase and psychosocial functions become more important in the cultivation phase with both sets of functions becoming less important in later stages of the mentoring relationship. In partial support of this theory, Chao (1997) was interested in the fact that mentoring functions vary by mentoring phases. Chao hypothesized that protégés in different phases of a mentorship would receive different levels of psychosocial and career-related support from their mentors. Chao concluded that protégés in the initiation phase report the lowest levels of psychosocial and career-related support compared to protégés in the other phases. This finding is consistent with Kram's (1983) definition of the initiation phase – initial interactions are occurring and expectations are developing. Even though results did not support the hypothesis that mentoring functions would be maximized in the cultivation phase, Chao's study provides some support to Kram's theory of mentoring functions.

Besides Chao's work, research on mentoring functions has failed to advance beyond the works of Kram. Since then, two studies attempted to develop a measure of mentoring functions (Olian, Carroll, & Giannantonio, 1988; Noe, 1988). Olian et al., reported similar results to Kram's: mentors are providing two major roles – an instrumental role similar to Kram's career functions, and an intrinsic role similar to Kram's psychosocial functions.

Noe (1988) was the second person to develop an instrument to measure mentoring functions. Noe's instrument was designed to assess the extent to which various types of

mentor functions were provided by mentors according to protégé's perceptions. A 32 item questionnaire was developed on the basis of Kram's career and psychosocial functions. Protégés were asked to respond to the items based on the extent to which the items described their mentoring relationship. Results from this study also indicated that career and psychosocial functions were practiced by mentors.

Mentoring Outcomes

Research indicates that mentoring has had many positive outcomes for both the mentor and protégé. Further, research has found significant relationships between mentoring functions and outcomes. Studies such as those done by Chao (1997), Fagenson-Eland (1989), Fagenson-Eland et al. (1997), and Scandura (1992) found that mentored individuals perform better on the job, advance more rapidly within the organization (e.g. get promoted more quickly and earn higher salaries), report more job and career satisfaction, and express lower turnover intentions than their nonmentored counterparts. Overall, higher levels of mentoring functions are related to more positive outcomes (Chao; Fagenson-Eland; Scandura, 1992). These findings give organizational managers reason to utilize mentoring.

From an educational standpoint in a college setting with undergraduates, Anderson et al. (1995) researched whether mentoring has an impact on student academic achievement. A positive relationship between access to faculty mentoring and undergraduate academic success was reported. Specifically, "students who received advice and guidance about their educational program, intellectual challenge and stimulation, letters of recommendation, or faculty interest in their education progress had higher grade point averages than those who did not receive such attention" (Anderson et al., p. 17). However, a major limitation to this

study was reverse causality. The authors pointed out that perhaps students with a high grade point average are more inclined to seek guidance from a faculty mentor and not vice-versa.

Psychosocially, Eby et al. (2000) mentioned the fact that mentoring is an "intense interpersonal relationship" (p. 2). Kram (1985) found that when mentors were inviting and supportive, the protégé felt supported, respected, or admired during the initiation phase. Kram (1985) further explained that protégés reported feeling more competent, having more self-confidence, and having a more optimistic view of the future in the cultivation phase as a result of their mentor. Because the mentoring relationship is said to be beneficial to both mentorship partners, mentors reported having new attitudes and values of support and nurture. Both mentors and protégés agreed that there was an increase in informal contact and mutual support in their developmental relationship and their evolving friendship (Kram, 1985).

On the downside, Eby et al., (2000) and Scandura (1998) focused on dysfunctional mentoring relationships and negative outcomes. Referring to this issue as the "dark side" (p. 463) of mentoring, Scandura pointed out that negative mentoring experiences receive only scant research attention. Scandura explained that perhaps the reason for not studying negative experiences or dysfunctional relationships is because it's a "taboo topic" (p.463) and most people would prefer to focus on the positive side of the relationship. However, concentrating on the "dark side" serves as the corrective lens needed to diagnose dysfunctions that are believed to impede mentoring outcomes.

In the work of Eby et al. (2000), a tripartite definition of a negative mentoring relationship was developed with the help of empirical and practitioner literature. It was operationally defined as "specific incidents that occur between mentors and protégés,

mentors' characteristic manner of interaction with protégés, or mentors' characteristics that limit their ability to effectively provide guidance to protégé" (Eby et al., p. 3).

Additionally, Eby et al. (2000) created a coding taxonomy for categorizing the negative mentoring experiences investigated. As a result of the content analysis, five broad categories were formed – Match within the Dyad, Distancing Behavior, Manipulative Behavior, Lack of Mentor Expertise, and General Functionality (Eby et al.). The most prevalent negative experiences encountered by protégé were neglect, mentor lack of interpersonal skills, mentor abuse of power, and incompatibility of value and work habits between the mentor and protégé. Eby et al. believed that these factors were distinct catalysts of negative mentoring experiences.

Adaptations of the Mentoring Functions Model

Much research has been done investigating Kram's two categories of mentoring functions, career and psychosocial, broadly (Noe, 1988; Scandura, 1992; Schockett et al., 1983,1985), while little research has focused on individual functions within the two categories (Ragins & McFarlin, 1990; Fowler & O'Gorman, 2005). However, some research of the latter type has re-examined Kram's mentoring functions model. Ragins and McFarlin's study (1990) used Kram's model to study mentor roles in cross-gender mentoring relationships. To adapt the model to their study, parents and social functions were added to Kram's nine functions.

Likewise, Fowler and O'Gorman (2005) repeated Kram's qualitative work to examine the relevance of her functions in contemporary organizational life. The study found several similarities and few differences to Kram's functions. For example, Fowler and O'Gorman's advocacy component was parallel to that of Kram's sponsorship, and the role

modeling component of the contemporary mentor relationship was very similar to that of what Kram described. The differences were the discovery of the learning facilitator component, not present in Kram's initial functions, and the absence of Kram's protection function.

However, Ragins and McFarlin's (1990) and Fowler and O'Gorman's (2005) models are only generalizable to the organizational setting because some aspects such as direct assistance with academics are absent in their models. Using such models would not completely correspond with settings that are both organizational and educational. Therefore, the researcher of this study has elected to use a model that incorporates Kram's functions, which relate to career development and education.

The model used was developed by Brzoska et al. (1987) in the *Mentor Teacher Handbook* (Figure 2). The mentoring functions of this model are a combination of career and psychosocial functions that can be incorporated into an educational setting. The six mentoring functions of the model are: 1) Informal Contact, 2) Role Modeling, 3) Direct Assistance, 4) Demonstration, 5) Observation and Feedback, and 6) Professional Development Planning Assistance.

Brzoska et al. (1987) reported that mentors and protégés frequently mentioned that informal discussions were the most valuable source of assistance during their mentoring relationship. Informal contact is contact or discussions that take place outside of the scheduled meeting sessions of the mentoring process. It is suggested that mentors make an effort to "stop in and check" on the protégé to offer advice, encouragement, and most of all, listen to any concerns or accomplishments. Additionally, Brzoska et al. recommend that the

mentor also make themselves available and easily accessible to the protégé, especially during the first few weeks of the mentorship.

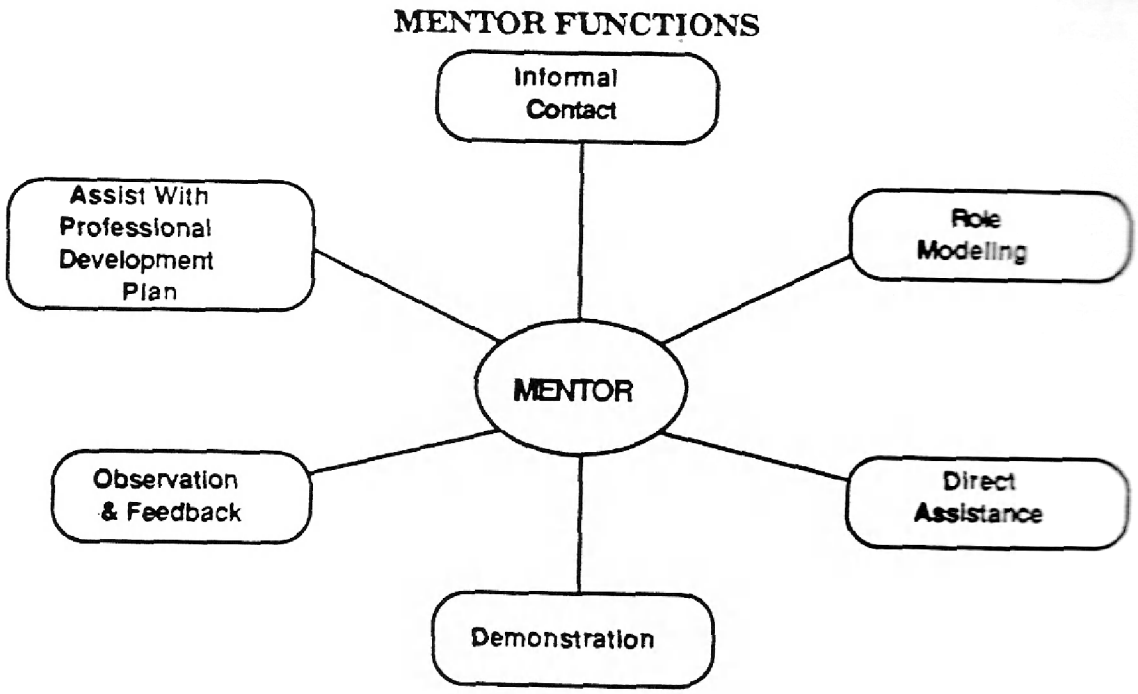

Figure 2. Brzoska et al. (1987) Mentor Functions Model

In addition to listening and lending words of encouragement, a mentor must also be a role model. Role modeling is much more than demonstrating, it's exhibiting professionalism; it's showing the protégé how to get things done properly, it's demonstrating realistic ways of problem solving, and it's exhibiting enthusiasm, self-confidence, security, and competence (Brzoska et al., 1987).

Providing direct assistance and demonstration are two other mentoring functions a mentor must provide. According to Brzoska et al. (1987), mentors should directly assist their protégé by: assisting them at setting and achieving goals; helping them organize and manage materials or equipment; suggesting techniques on how to keep records or to reflect in order to

make improvements; helping them become aware of written and unwritten rules; informing them of workshop opportunities; and introducing them to other staff members. Demonstration is incorporated when the mentor shows the protégé how to properly use any strategy, technique, or skill.

In conjunction with assisting and demonstrating, formal observation and feedback is essential for the protégé to improve. Brzoska et al. (1987) recommended using a three step procedure including a pre-conference, the observation, and a post-observation conference. This process allows the mentor and protégé time to identify goals and then review and analyze in order to recognize accomplishments and make recommendations for improvement. It is important for the mentor to remember to keep a balance of positive and negative feedback, and not to focus the conferences on what the protégé did, but rather provide examples of what they did and *why* it was or wasn't correct (Edwards and Ogden, 1998).

Completing the model are functions that assist in professional development planning. Brzoska et al. (1987) suggested that a mentor serve as a resource to provide information or opportunities to potential careers or further education. A great way of assisting is to create chances for the protégé to become involved in professional activities, associations, and special projects.

Examples of Mentoring Programs at the Undergraduate Level

One of the most common examples of mentoring is faculty to faculty or employer to employee (Edwards & Protheroe, 2004; Edwards & Ogden, 1998). However, Smink, (1999) reports that students (any level of education, gender or race) need mentoring as well for academic and career development. Even though findings from Anderson et al. (1995) do not

demonstrate causality, a positive relationship was reported between access to faculty mentoring and academic success (e.g. higher G.P.A.). Further, literature claims that students also need mentoring for career development.

According to the report *America's Choice: High Skills or Low Wages* (National Center on Education and the Economy, Commission on the Skills of the American Workforce, 1990), many American students were not obtaining the educational skills necessary to compete globally or to become part of a highly skilled American workforce. The United States government and business communities called on public education to improve the academic and occupational skills of students. Pressure from these groups created momentum for the adoption of work-based learning experiences and youth apprenticeship programs that involved mentoring (School-to-Work Opportunities Act, 1994).

Since the School-to-Work Opportunities Act (1994), dozens of colleges and universities have implemented mentoring programs. Wichita State University, Iowa State University, and Knoxville College are just three of the many colleges that have work-based learning programs for undergraduate students that incorporate mentoring.

Wichita State University's Career Network Experience (CNE) is a career mentoring program that pairs students with a community professional mentor working in their chosen career (Wichita State University, 2003). From this experience, students have a chance to gain insight into a career through the eyes of an expert. CNE is a 10-week course that helps students meet and network with other professionals, experience the professional culture of the workplace, get advice on ways to enhance the future, take classroom knowledge into the work environment, and receive one hour of academic credit. Mentors in CNE are typically

Wichita State University alumni and are required to meet with their student at least 12 hours a week.

While Wichita State University's program is external (students work off campus and mentors are community professionals), Iowa State University's is internal (students work on campus and mentors are faculty and staff). In 2005, a one-on-one mentoring program called Science With Practice (SWP) was developed at Iowa State University. Science With Practice takes an experiential learning approach to help students with agriculture majors link learning opportunities to work experiences while working with university faculty and staff mentors in the College of Agriculture (Retallick et al., 2005). The program expectations for student learning outcomes are to develop and acquire technical agriculture skills and organizational and planning skills related to research; reflect and link job skills to coursework; and link science/research to practical real-world situations. Participation in SWP provides students with financial benefits through hourly wages and educational benefits in the form of valuable work experience and academic credit.

Knoxville College's (2006) program, The Work Program, is slightly more complex than CNE or SWP. The Work Program requires students to progress through a series of four levels. In Level I, students are assigned various responsibilities on campus where they are allowed to demonstrate their abilities and work habits. At this level, mentors are departmental faculty members. The second level of The Work Program is designed to furnish service to the community by providing student workers to assist non-profit agencies and organizations with projects. Level II mentors are individuals from the participating agencies or organizations. At the third level, students gain initial exposure to the workplace by being assigned to positions with community businesses and employers. Mentors at the third level

are individuals from the designated companies or agencies. Students at the fourth level of The Work Program work a minimum of ten hours per week in positions with agencies directly related to their field of study. Level IV mentors are work supervisors or employers from the selected businesses. (Knoxville College, 2006).

The review of these programs revealed that student expectations, requirements, and benefits were thoroughly explained. However, mentor expectations and requirements were rarely considered or described. The lack of this information further justifies that faculty mentors are uneducated about how to foster an effective mentoring relationship with an undergraduate student (Stanley & Lincoln, 2005).

Mentoring and Education

In a closer look at mentoring in the academic world, Jacobi (1991) synthesized undergraduate education mentoring literature. The authors she reviewed agreed that mentor relationships are "reciprocal"- in that both the mentor and the protégé benefit. She also found consistency among the authors' findings to Kram's findings when she concluded that mentorships require direct interaction between mentor and protégé and that mentoring has a personal component and not just a career component (Jacobi). Even though Jacobi was able to identify these two components of mentoring, she found fifteen diverse attempts to operationally define mentoring, along with fifteen different functions or roles that have been assigned to mentors. Jacobi concluded that mentoring is still not clearly conceptualized in education.

Jacobi also found that there is a lack of theoretical models for undergraduate mentoring. Many of the models currently used do not completely cover the scope of mentoring. For example, Bandura's Social Learning Theory model (Jacobi, 1991), which has

often been used, describes the role of mentoring in the context of learning and fails to address other aspects of mentoring, such as professional or emotional support.

Summary of Mentoring Research

Previous research has investigated the mentoring relationship, the functions of a mentor, and the impacts of mentoring. Research on mentoring phases helped identify the functions present in each phase of the mentoring relationship. Mentoring function studies have shown that higher levels of mentoring functions lead to more positive outcomes for both individuals in the mentor relationship. Studying the conditions in which negative mentoring experiences occur and what mentors should do to produce a positive, effective mentoring experience are evident in the works of Brzoska et al. (1987); Eby et al. (2000); and Scandura (1998). Further, Kram (1985) suggested that interpersonal, communication, and listening skills are critical components of effective mentoring. Fowler and O'Gorman (2005) pointed out that due to the positive outcomes mentoring provides, organizations are increasing the use of mentoring relationships to improve individual and organizational effectiveness.

Most important for this study, mentoring research in education has offered little support to undergraduate mentoring. Despite the fact that over the years a variety of mentor functions have been discovered and dozens of colleges and universities have implemented faculty-to-student mentoring programs, there is still a general lack of agreement about a mentoring definition and use of theoretical models. These concerns warrant more research in this area, and Jacobi (1991) strongly encouraged conducting more research about mentoring at the undergraduate level.

Research Questions

The following research questions framed and directed this study:

1. What perceptions do the faculty in the College of Agriculture at Iowa State University have about mentoring?
2. What mentoring functions are practiced by faculty in the College of Agriculture at Iowa State University and to what extent are specific mentoring functions practiced?
3. What are the differences in the practice of mentoring functions among selected demographic variables?

CHAPTER III. METHODS

The purpose of this descriptive census study was to determine the perceptions of the faculty in the College of Agriculture at Iowa State University regarding undergraduate mentoring. The objectives of the study were to:

1. Describe demographic characteristics of the faculty participants.
2. Determine faculty perceptions about mentoring.
3. Determine the mentoring functions practiced and the extent to which they are practiced by faculty in the College of Agriculture.
4. Compare the mentoring functions practiced among selected demographic variables.

This chapter outlines the methods and procedures used to collect and analyze the data. First, the research design used in the study is discussed. A description of participants, an explanation of instrument development, and procedures for determining reliability and validity are also included. Finally, the procedures used to collect and analyze the data are described.

Research Design

A descriptive survey research design was used for the collection and analysis of data for this study. This design was deemed appropriate for the study because the study's objectives sought to explore and describe an issue and behaviors. The required data were obtained by using a web-based survey. Ary, Jacobs, and Razavieh (2002) noted that because college faculty and staff typically have universal e-mail access, web survey links sent via e-mail have become increasingly popular and are often successful on college campuses. According to Dillman (2000), web-based surveys have the advantages of prompter returns, lower item nonresponse, and more complete answers to open-ended questions.

Subjects

The study's focus was on the mentoring practiced by the College of Agriculture faculty at Iowa State University. Thus, the population for this study consisted of the 2006 College of Agriculture faculty members at Iowa State University. A list of the current Iowa State University College of Agriculture faculty was obtained from the College of Agriculture Dean's Office. The list, consisting of 408 faculty members, was purged for duplications and any collaborating faculty members were removed giving a total accessible population of 378. Collaborators at Iowa State University are faculty members that assist with scientific research, but are primarily associated with another agency or organization (e.g. United States Department of Agriculture – USDA). For this study, faculty collaborators were removed from the list because their faculty responsibilities involved little to no contact with undergraduate students.

Instrumentation

A search of related literature revealed that Noe (1988) was the first to develop an instrument to assess the various types of mentoring functions. Noe's instrument was designed to assess the mentoring functions as presented in Kram's (1983) Mentor Function Model from the protégé's perspective. However, this study focused on the mentor's perspective, thus the items in Noe's instrument were restructured to obtain the mentor's perspective for this study.

Additionally, the functions used in Noe's (1988) instrument were incorporated into one of the six functions presented in Brzoska et al. (1987) model. Noe's instrument used the original names Kram (1983) used to classify the nine functions in her Mentor Function Model. Even though Brzoska et al. and Kram referred to the functions by different names, the

fundamental nature of the functions were not different. For example, Noe's statement M*entor gave you assignments that presented opportunities to learn new skills* derived from Kram's (1983) Challenging Assignments function. This statement corresponded with Brzoska et al. Assistance with Professional Development function, and was restated as *I give assignments to my students that present opportunities to learn new skills* for this study. Therefore, Noe's instrument was used as a model for designing an instrument capable of measuring the six functions presented by Brzoska et al.

The questionnaire developed for this study consisted of four sections: Perceptions of Mentoring, Extent of Mentoring Practiced, General Mentoring Questions, and Demographics (Appendix A). The following paragraphs describe the questionnaire sections and provide a rationale for their inclusion.

The first section of the questionnaire was developed from an extensive review of mentoring literature. This section consisted of 25 statements designed to assess the respondents' perceptions of the undergraduate mentoring process. The rationale for this section was to gain understanding of what faculty know about mentoring in general. A lack of mentoring knowledge may affect mentoring behaviors. The response format used in this section was a Likert-type scale where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.

The format of section two was adopted from Noe's instrument. This section was designed to determine which mentoring functions were practiced and the extent to which *each* function was practiced by College of Agriculture faculty at Iowa State University. The section consisted of 30 questions, five questions for each of the six mentoring functions listed in the Brzoska et al. Mentor Function Model (1987). The first set of five items dealt with

informal contact, the second set of five items dealt with role modeling, the third set of five items dealt with direct assistance, the fourth set of five items dealt with demonstration, the fifth set of five items dealt with observation and feedback, and the last five items dealt with professional development assistance. The response format for this section was a Likert-type scale where 1 = Never, 2 = Sometimes, 3 = Often, 4 = Always.

The third section of the questionnaire was titled General Questions. This section was designed to generate information about the Iowa State University College of Agriculture faculty mentor including how many hours they interact and actually mentor per week, what, if any kind of professional development training related to mentoring they had, and if they were interested in professional development in mentoring, what topics would they most likely want to learn about.

The last section of the questionnaire contained demographic questions. This section was intended to provide descriptive information about the respondents. Participants were asked to provide some basic demographic information about their Iowa State University title (e.g. associate professor), the College of Agriculture department primarily associated with, their primary responsibility (e.g. 25 % research and teaching 75%), number of years employed by Iowa State University, and their age.

In the development of this instrument, elements of the tailored design method (TDM) as established by Dillman (2000) were utilized. According to Dillman, the tailored design method attempts to reduce the four most common survey errors – sampling, coverage, measurement, and nonresponse error.

For this study, the first two sources (sampling and coverage) of survey error do not apply because this was a census study. Therefore, all of the participants involved had equal

opportunity to respond. However, measurement and nonresponse error was addressed in the development and completion of the survey instrument. Measurement error is the result of poor question wording or questions being presented in such a way that inaccurate or uninterruptible answers are obtained (Dillman, 2000). When developing the survey instrument, the researcher considered directions from Dillman regarding the following: how to complete the survey, the order and format of questions (open-ended or close-ended), and length and appearance of the survey.

Dillman's (2000) last source of survey error is nonresponse error, which results from respondents' data differing from data collected from the nonrespondents. The most acceptable and commonly used method of controlling for nonresponse bias is Miller and Smith's (1983) "double-dipped" approach. This approach consists of drawing a random sample (10% to 20%) of nonrespondents and obtaining responses through an interview style. Data collected from the nonrespondents are then statistically compared to the respondents. If similar, both groups of data are pooled and generalized to the specific population.

After analyzing how nonresponse bias was handled in the Journal of Agricultural Education articles, Linder, Murphy, and Briers (2001) recommended using a minimum of 20 responses from a random sample of nonrespondents when comparing respondents to nonrespondents. The rationale behind this recommendation is that fewer than 20 responses limit the statistical power to detect differences between respondents and nonrespondents. Thus, if 20 responses from nonrespondents can be obtained, and the results show no significant differences, the groups can be combined and results can be generalized to the population. However, if a statistically significant difference is found, the data must be analyzed separately and generalized with caution.

Validity and Reliability

Ary et al. (2002) defined validity as the degree to which an instrument measures what it claims to measure. Reliability refers to the ability of an instrument to yield consistent results. This section discusses how validity and reliability were addressed in this study. Content and face validity are discussed first, followed by reliability.

Dillman's (2000) pre-testing approach was used to determine content and face validity of the instrument used in this study. The stages used were:

Stage 1: Review by knowledgeable colleagues and analysts

Stage 2: Interview to evaluate cognitive and motivational qualities

Stage 3: A final check (p. 140-148)

To accomplish Stage 1, the questionnaire was reviewed by a panel of twelve colleagues to ensure content and face validity. The panel was comprised of six professors and five graduate students from the Department of Agricultural Education and Studies at Iowa State University, three faculty mentors from the Science With Practice program, and Dr. Raymond Noe, College of Business professor from The Ohio State University. Informal interviews with each panel member were conducted to discuss the questionnaire items and overall appearance of the instrument in fulfillment of Stage 2.

Stage 3 of Dillman's (2000) pre-testing approach was to ask a small number of people who had nothing to do with the development, revisions, or materials related to the survey instrument to complete the questionnaire. The researcher selected five students and faculty mentors from the Science With Practice program who had no role in the development of the survey instrument to fill out the questionnaire and provide any feedback regarding the format, syntax and eye-appeal.

A post-hoc reliability coefficient for the survey instrument was determined by Cronbach's alpha reliability test. Ary et al., (2002), recommended a moderate reliability coefficient of .60 or above "if results are to be used for making decisions about a group or for [educational] research purposes" (p 262). The Cronbach's reliability coefficients were .74 and .89 for the respective sections of the questionnaire – Perceptions of Mentoring and Extent of Mentoring Practiced, revealing that the instrument was adequately reliable for the study. High reliability coefficients assured the researcher that the same construct was being measured by all items in the scale. Noe (1988) reported high reliability coefficients for the career-related functions (.89) and psychosocial-related functions (.92). The items regarding mentoring functions in Noe's instrument were similar to the items used in section two of this study's questionnaire.

The final draft of the questionnaire and procedures proposed for use in this study were submitted and approved by Iowa State University's Institutional Review Board (IRB) (Appendix B).

Data Collection

SurveyMonkey (1999), a service provided to graduate researchers in the Department of Agricultural Education and Studies by Dr. Gaylan Scofield, Interim Director, Brenton Center for Agricultural Instruction & Technology Transfer at Iowa State University, was used to create the instrument used in this study. SurveyMonkey allows a researcher to quickly conduct professional online surveys. An e-mailed link to a web-based survey was suitable for this study and its participants because it involved a college campus setting where university e-mail was used; and it provided a quick and easy procedure for participants to respond.

Data were collected following Dillman's (2000) recommended five contacts (Appendix C) for achieving high response rates. The recommended contacts are:

1. A pre-notice letter
2. The questionnaire
3. A thank-you/reminder
4. A replacement questionnaire
5. A final contact

A pre-notice e-mail was sent by the researcher on March 30, 2006 notifying the participants of the study's purpose and reminding them how important their responses were to the study. On April 3, 2006, the official questionnaire and cover letter was sent to all potential participants, attached as a link in an e-mail from the SurveyMonkey program. Elements of an informed consent were provided in the cover letter as requested by the Institutional Review Board. By submitting a completed questionnaire, the participants were giving consent to participate. A decline option link was available for those who did not wish to participate.

A feature SurveyMonkey offers is that it keeps track of who has responded, declined or not responded. It also allows the researcher to send a reminder e-mail. A reminder e-mail for this study was sent to the nonrespondents through SurveyMonkey on April 10, 2006. As soon as a questionnaire was submitted, a thank you message appeared expressing the researcher's appreciation for the respondent's participation. The replacement questionnaire was sent on April 17, 2006, giving the respondents the deadline of April 24, 2006 to complete the questionnaire. Ary et al. (2002) recommended setting a deadline to urge immediate return.

Nonrespondents remaining after the deadline were sent a final contact letter and hard copy of the questionnaire via campus mail notifying them that the study was nearing a close and stressing the importance of their participation in the study. As recommended by Dillman (2000), using diverse methods of contacts can increase response rate and show researcher dedication. In the final contact letter, the nonrespondents were given directions to complete the questionnaire electronically by using the SurveyMonkey link, as well as directions on how to complete the paper copy questionnaire. A self-addressed envelope was provided for the respondents to return the questionnaire. Again, a completed questionnaire signified consent of participation and a returned blank questionnaire indicated a decline of participation. The questionnaires were requested to be returned by May 5, 2006.

Once the deadline expired, the researcher followed the Linder et al. (2001) recommendations for addressing nonresponse error. On May 9, 2006 nonrespondents were numbered and randomly selected from a list of potential participants, which was provided by SurveyMonkey. The nonrespondents were contacted via phone and administered the survey as an interview until 20 questionnaires were completed. During the telephone interview, the researcher asked the respondents for consent to participate, then read the questions, statements, and response options and recorded their responses. The survey was closed on May 11, 2006.

Fourteen randomly selected statements were used to make a comparison between the respondents and the 20 responses collected from the nonrespondents. The results showed there was no statistically significant difference between the groups. Therefore, data from the groups were combined, and the results were generalizable to the 2006 College of Agriculture

faculty at Iowa State University (Appendix D). Of the 378 questionnaires sent, a total of 203 questionnaires were returned for a response rate of 53.7%.

However, it should be noted that fifteen respondents appeared to have not responded to 30 of the same items in section two of the questionnaire. The researcher was unable to determine the cause of this event, but suspected there may have been technical difficulties with the SurveyMonkey data record system. To handle this situation, data from completed sections of the questionnaire were used regardless if that same participant did not complete other sections. Therefore, each section had a different number of respondents. In all, a total of 200 questionnaires were used, giving a useable return rate of 52.9%.

Data Analysis

The purpose of this study was to determine the mentoring functions practiced by College of Agriculture faculty at Iowa State University. The study focused on the following objectives:

1. Describe demographic characteristics of the faculty participants.
2. Determine faculty perceptions about mentoring.
3. Determine the mentoring functions practiced and the extent to which they are practiced by faculty in the College of Agriculture.
4. Compare the mentoring functions practiced among selected demographic variables.

Data from each section of the questionnaire helped accomplish each objective.

SurveyMonkey coded the data and provided a format in which the raw data were entered into an Excel spreadsheet and then imported into Statistical Analysis Software (SAS for Windows version 9.1). The demographic and general questions data were analyzed using frequency tables reporting the frequencies and percentages of responses to each statement for

objective one. For objective two, mean and standard deviation were used to analyze the data from section one. To accomplish objective three a composite score was formed for each function by grouping the means for each successive five items, which represented a mentor function. Means and standard deviations for each mentor function were reported.

For objective four, the selected demographic variables compared were: faculty title, responsibility area, faculty age, and department. The faculty title categories were: professors, associate professors, and assistant professors. Extension, teaching, and research made up the responsibility area group and the three faculty age categories formed were: 27 to 40 years, 41 to 60 years, and 61 to 80 years. The departments were classified into four common groups: Biological Sciences, Social Sciences, Plant & Environmental Sciences, and Biosystems/Pre-Vet. The Biological Sciences group consisted of the Biochemistry, Biophysics and Molecular Biology (BBMB), Genetics Development and Cell Biology (GDCB), and Plant Pathology departments because they were all biological or microbiologically based. Departments that made up the Social Sciences category, Agricultural Education and Studies (AGEDS), Economics, Sociology, and Statistics, were grouped based on their focus of human service, development, and behavior in business or industry at the personal, community, regional, national, and international levels. Plant and Environmental Sciences included the Horticulture, Agronomy, Ecology, Evolution and Organismal Biology (EEOB), and Natural Resource and Ecology and Management (NREM) departments. This group was created based on the relationship of plants and the environment. The fourth group, BioSystems, consisted of the Animal Science, Agricultural Biosystems Engineering (ABE), Food Science and Human Nutrition (FSHN), and Entomology departments. These departments focus on management, processing, storage, handling, and

use of the food and fiber production system and other biological products. Analysis of variance (ANOVA) was used to identify statistically significant differences among the four groups of departments. An alpha level of .05 was set a priori.

Assumptions and Limitations

A major underlying assumption of this study was that the faculty participants actually mentored undergraduate students. The participants' claim of undergraduate interaction, whether through classes, work, research, or advising, was considered to involve mentoring activities.

It was also assumed that all respondents were given equal opportunity to participate. The faculty list obtained from the College of Agriculture Dean's office at Iowa State University was assumed to be up-to-date and to contain accurate e-mail addresses for all participants. However, not every faculty member in the College of Agriculture was available to participate at the time of the study (e.g. some faculty members were on sabbatical leave).

It should be noted that this study concentrated on the participants' perceptions of the mentoring functions practiced at the time of the study. Though information about the participants' history of formal mentoring training was requested, past expectations and experiences of those that had participated in other mentoring programs or had been a protégé in a mentoring relationship may have influenced perceptions of the undergraduate mentoring process. Therefore, the results of this study reflect only the time span in which the data were collected.

Another limitation of the study was that the results were based on data gathered from a single institution. The population of this study was limited to the 2006 College of Agriculture faculty at Iowa State University. Therefore, the results are generalizable only to

this population. However, methodological procedures indicate that the study may be replicated in other colleges, universities, and departments statewide or even nationally.

CHAPTER IV. FINDINGS

The purpose of this study was to determine the perceptions of the faculty in the College of Agriculture at Iowa State University regarding the undergraduate mentoring process. The study sought to identify faculty perceptions about undergraduate mentoring and the extent to which specific mentoring functions were practiced by faculty. The findings and results of this study are presented in five major sections relating to the study's objectives: 1) Demographic Characteristics, 2) Perceptions about Mentoring, 3) Definitions of Undergraduate Mentoring, 4) Mentoring Functions and the Extent Practiced, and 5) Comparisons of Mentoring Functions Practiced Among Selected Demographic Variables.

Demographic Characteristics

Findings presented in this section were generated from parts three and four of the questionnaire. Participants were asked to provide basic demographic information about their Iowa State University title (e.g. associate professor), the College of Agriculture department with which they were primarily associated, their primary responsibility (e.g. 25 % research and teaching 75%), number of years employed by Iowa State University, and their age.

Titles

Respondents were predominantly professors (39.9%), associate professors (24.5%) and assistant professors (15.9%). All seven title categories were represented, with only one respondent holding the title of Instructor. The "other" category (7.5%) consisted of titles such as: senior lecturer, professor and chair, distinguished chair, endowed chair, professor/collaborator, and adjunct assistant professor. Figure 3 displays the respondents by faculty title.

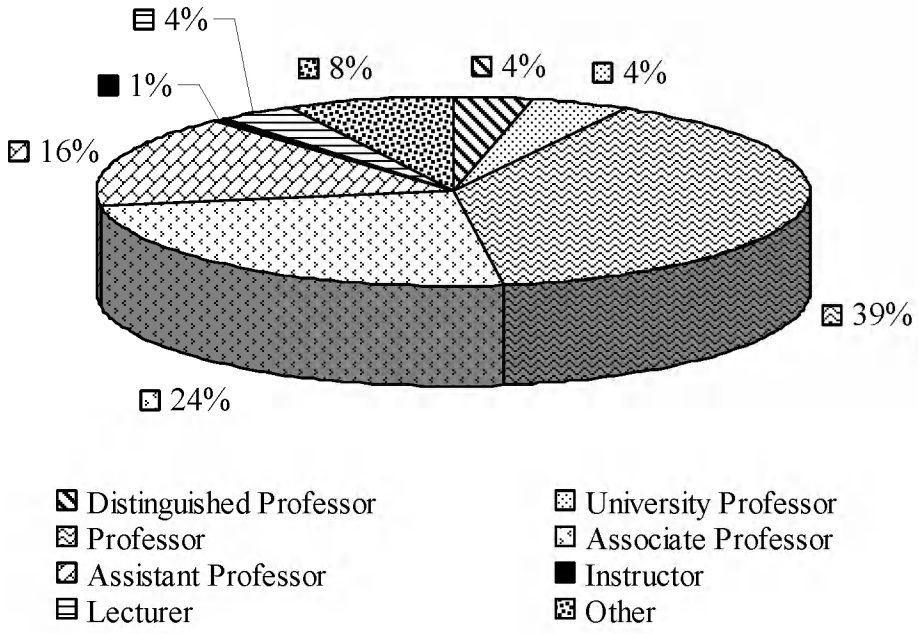

Figure 3. Distribution by title of the 2006 Iowa State University College of Agriculture faculty responding to a questionnaire on mentoring (n = 187)

College of Agriculture Departments

The Agronomy (18.5%), Animal Science (15.8%), Agricultural and Biosystems Engineering (9.2%), and Food Science and Human Nutrition (8.7%) departments had the highest number of respondents (Table 2). Entomology and Economics each made up 6.5% of the total, and NREM (Natural Resource Ecology and Management) made up 5.4% of the total number of respondents. Horticulture and Sociology each made up 4.9% of the total number of respondents, Plant Pathology made up 4.4% of the total respondents, and Agricultural Education and Studies, BBMB (Biochemistry, Biophysics and Molecular Biology), and Statistics each made up 3.8% of the total. Six respondents were from EEOB (Ecology, Evolution and Organismal Biology) (3.3%), and only one (0.5%) respondent was from the Genetics Development and Cell Biology (GDCB) department.

Table 2. Frequencies and percentages of faculty participants in the College of Agriculture at Iowa State University by department (n = 184)

Department	Frequency	Percentage
Agronomy	34	18.5
Animal Science	29	15.8
Agricultural & Biosystems Engineering	17	9.2
Food Science & Human Nutrition	16	8.7
Economics	12	6.5
Entomology	12	6.5
Natural Resource Ecology & Management	10	5.4
Horticulture	9	4.9
Sociology	9	4.9
Plant Pathology	8	4.4
Agricultural Education & Studies	7	3.8
Biochemistry, Biophysics & Molecular Biology	7	3.8
Statistics	7	3.8
Ecology, Evolution & Oranismal Biology	6	3.3
Genetics, Development & Cell Biology	1	0.5

Responsibility Area

The respondents' primary responsibility area was research (51.6%). Teaching constituted 24.2% and extension made up 13.4% of the respondent's areas of responsibility (Figure 4). The "other" category (10.8%) for primary responsibilities consisted of special cases such as administrative appointments, 50% research and 50% teaching, or equal assignments of research, teaching, and extension.

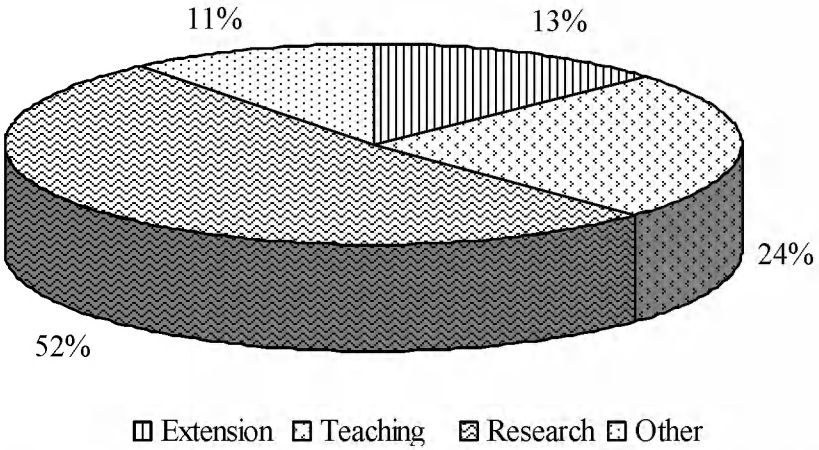

Figure 4. Distribution by responsibility area of the 2006 Iowa State University College of Agriculture faculty responding to a questionnaire on mentoring (n = 186)

Years Employed by Iowa State University and Age

Respondents were asked to identify how many years they had been employed by Iowa State University, along with their age (Table 3). The average number of years employed was 15.4 years (SD = 10.7). A majority of the respondents had been employed for one to ten years (41.0%). Three respondents had been employed at Iowa State University for over 41 years (1.6%). One of those respondents had been employed at Iowa State University for 50 years. Other respondents had been employed at Iowa State University from 11 to 20 years (26.8%), 21 to 30 years (22.9%), and 31 to 40 years (7.7%). Distribution of respondents by the number of years employed by Iowa State University is displayed in Figure 5.

Table 3. Means and standard deviations of years employed by Iowa State University[a] and age[b] of faculty responding to a questionnaire on mentoring in the College of Agriculture at Iowa State University

Demographic Item	Minimum	Maximum	Mean	SD
Years employed at Iowa State University	1	50	15.4	10.7
Age	27	80	49.9	9.1

[a] n = 183
[b] n = 175

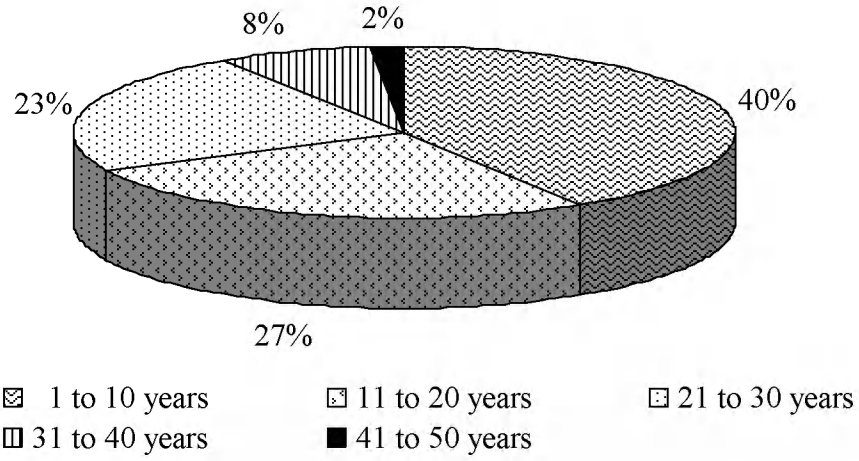

Figure 5. Distribution by years employed at Iowa State University of the 2006 Iowa State University College of Agriculture faculty responding to a questionnaire on mentoring (n = 183)

The average age of the respondents was 49.9 years with a standard deviation of 9.1. The age category of 51 to 60 years made up 41.2% of the respondents. The age category 41 to 50 comprised 33.1% of the respondents, the 31 to 40 age category made up 14.9% of the respondents, and the 61 to 70 age category made up 7.4% of the total. The 30 and under category (1.3%), and the 71 to 80 age category, each had three respondents (1.7%). Distributions of respondents by age are displayed in Figure 6.

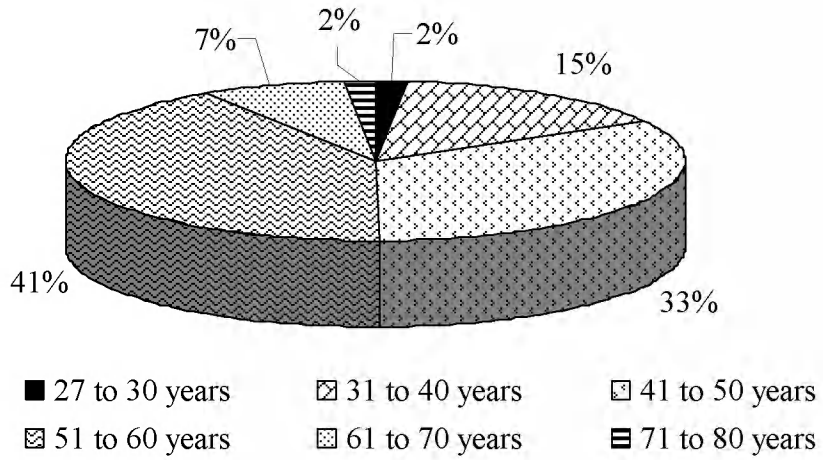

Figure 6. Distribution by age of the 2006 Iowa State University College of Agriculture faculty responding to a questionnaire on mentoring (n = 175)

Groups Mentored

Respondents primarily mentored undergraduate student employees (25.4%). Undergraduate advisees (16.5%), student organizations/clubs (14.3%), student interns (14.2%), and independent study/cooperative education students (13.9%) were also groups respondents mentored. Respondents reported that they mentored fewer students in Science With Practice (4.2%) and learning communities (3.8%). Figure 7 displays the groups of students mentored by the respondents. Other groups mentored by respondents included undergraduates in classroom and lab sections, mock and exit interviews and competitive teams (e.g. livestock judging). Respondents also mentored undergraduate research assistants, Freshman Honors students, Life in Iowa program, PWSE (Program for Women in Science and Engineering), and Agronomy Endowment Undergraduate Professional Development Research Fellowship students.

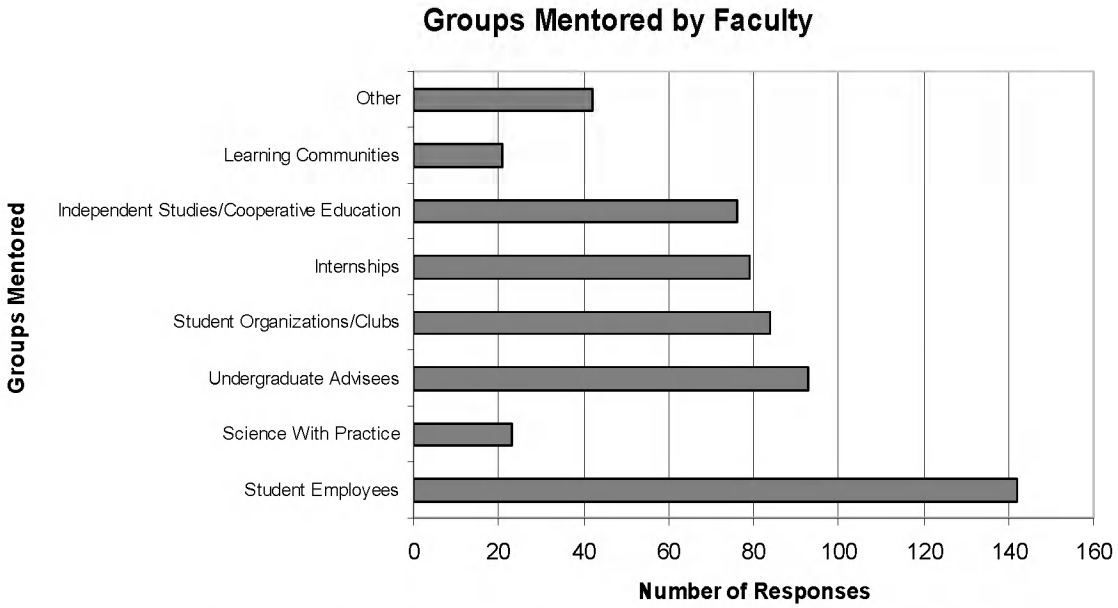

Figure 7. Distribution of the undergraduate student groups mentored by the 2006 Iowa State University College of Agriculture faculty responding to a questionnaire on mentoring (n = 187)

Hours Spent Interacting and Mentoring

As seen in Table 4, the hours spent interacting with students ranged from a half an hour to 50 hours per week. On average, the respondents spent 9.1 hours (*SD* = 7.9) interacting with students per week. Respondents indicated that they actually mentored, on average, 4.96 of the hours (*SD* = 6.36) reported interacting (9.1 hours) with students. The hours spent mentoring students ranged from zero to 50 hours.

Table 4. Means and standard deviations of hours Iowa State University's College of Agriculture faculty spent interacting[a] and mentoring[b] students

Hours spent per week	Minimum	Maximum	Mean	SD
Interacting with students	0.5	50	9.12	7.92
Mentoring students	0	50	4.96	6.36

[a] $n = 182$
[b] $n = 181$

Perceptions of Mentoring

Objective two of this study was to determine perceptions about mentoring. Table 5 displays descriptive statistics of faculty responses to 25 statements regarding mentoring. Faculty members were asked to indicate the extent to which they agreed with each statement based on a five-point Likert type scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree).

The statement, *Mentors play many roles*, had the highest mean value (*M* = 4.19) and a standard deviation of .65. *Mentoring is a process involving an exchange of information*, closely followed with a mean of 4.18 and a standard deviation of .51. The next two statements, *A mentor assists the protégé in developing a sense of professional identity*, and *A mentor is an information source*, each had a mean of 4.16 and standard deviations of .59 and .55 respectively. The other statements that had fairly high ratings according to their means

were *A mentor demonstrates strategies for accomplishing goals* (*M* = 4.11; *SD* = 0.53), *Mentoring is career development assistance* (*M* = 4.01; *SD* = 0.68), *A mentor observes protégé performance* (*M* = 3.96; *SD* = 0.63), *Mentors should be active not passive* (*M* = 3.94; *SD* = 0.68), *Mentoring is a systematic process* (*M* = 3.78; *SD* = 0.85), *Mentoring is a skill that requires training* (*M* = 3.74; *SD* = 0.82), *Mentoring involves counseling a protégé* (*M* = 3.71; *SD* = 0.74), and *Mentors demonstrate exemplary job skills.* (*M* = 3.67; *SD* = 0.71). There were 11 statements that had means indicating a neutral response: *Mentors that are chosen are more effective than assigned mentors* (*M* = 3.49; *SD* = 0.95), *Mentoring consists of frequent informal conferences* (*M* = 3.43; *SD* = 0.88), *A mentor serves as an advocate for the protégé* (*M* = 3.41; *SD* = 0.87), *A mentor is a role-specific model in the discipline* (*M* = 3.38; *SD* = 0.96), *A mentor serves as a sponsor to a protégé* (*M* = 3.30; *SD* = 0.85), *Mentoring is a socialization process* (*M* = 3.17; *SD* = 0.93), *The best mentors are directive in the process* (*M* = 3.13; *SD* = 0.90), and *Mentoring is a relationship between an older, more experienced person and younger, inexperienced person* (*M* = 3.10; *SD* = 1.05), *Mentoring is based on friendship* (*M* = 2.78; *SD* =0.89), *The protégé should lead the mentoring process* (*M* = 2.71; *SD* = 0.82), and *Mentors have a greater intellectual status than protégés* (*M* = 2.60; *SD* = 0.93).

There were only two statements with which the respondents disagreed. The statements were: *Mentoring is a casual, laid back process of giving advice* (*M* = 2.24; *SD* = 0.82), and *Mentoring is the same as academic advising* (*M* = 2.09; *SD* = 0.86).

Table 5. Means and standard deviations of the perceptions of mentoring statements according to faculty in the College of Agriculture at Iowa State University (n = 200)

Mentoring Statements	n	Mean	SD
Mentors play many roles.	200	4.19	0.65
Mentoring is a process involving an exchange of information.	199	4.18	0.51
A mentor assists the protégé in developing a sense of professional identity.	200	4.16	0.55
A mentor is an information source.	200	4.16	0.59
A mentor demonstrates strategies for accomplishing goals.	200	4.11	0.53
Mentoring is career development assistance.	198	4.01	0.68
A mentor observes protégé performance.	199	3.96	0.63
Mentors should be active not passive.	199	3.94	0.68
Mentoring is a systematic process.	200	3.78	0.85
Mentoring is a skill that requires training.	200	3.74	0.82
Mentoring involves counseling a protégé.	200	3.71	0.74
Mentors demonstrate exemplary job skills.	199	3.67	0.71
Mentors that are chosen are more effective than assigned mentors.	196	3.49	0.95
Mentoring consists of frequent informal conferences.	200	3.43	0.88
A mentor serves as an advocate for the protégé.	200	3.41	0.87
A mentor is a role-specific model in the discipline.	196	3.38	0.96
A mentor serves as a sponsor to a protégé.	200	3.30	0.85
Mentoring is a socialization process.	199	3.17	0.93
The best mentors are directive in the process.	199	3.13	0.90
Mentoring is a relationship between an older, more experienced person and younger, inexperienced person.	199	3.10	1.05
Mentoring is based on friendship.	200	2.78	0.89
The protégé should lead the mentoring process.	198	2.71	0.82
Mentors have a greater intellectual status than protégés.	198	2.60	0.93
Mentoring is a casual, laid back process of giving advice.	200	2.24	0.82
Mentoring is the same as academic advising.	197	2.09	0.86

Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree

Definitions of Undergraduate Mentoring

Respondents were asked to provide their own definition of undergraduate mentoring. In the 126 definitions provided, 33 common terms and phrases were used to define undergraduate mentoring. Table 6 summarizes those terms and phrases by arranging them in order from the highest to the lowest number of occurrences within the 126 definitions.

The definitions containing the terms guide, guiding, or guidance were found most often in the definitions (n = 26). Examples of how the terms were used to define undergraduate mentoring are:

- "Providing students with academic and career information and guiding them to choose the path that is most suited to them."
- "Providing a realistic guide to help students define their options and make choices about their future. It is not making choices for them."
- "Undergraduate mentoring is the process associated with guiding students to become professionals. This includes development of technical skills and abilities, communication skills, and an awareness of the demands and opportunities inherent in a discipline."

The second most commonly used terms were personal, academic, and career/professional development. These three terms, or similar versions and meanings of the terms, were found in 25 responses. The following are examples of how the terms were used:

- "To help a student advance in their academic and professional development as well as in their personal growth."
- "Mentoring is a combination of academic, career and personal advice. It is also providing guidance when needed."
- "Assist students with progression through their academic programs, be a first line of contact for questions related to academics, student life, and career development/preparation."

Table 6. Terms and phrases used to define undergraduate mentoring according to faculty in the College of Agriculture at Iowa State University (n = 126)

Terms and Phrases	n
Guide/Guiding/Guidance	26
Personal, Academic, and Career/Professional Development	25
Career Development	22
Goals	17
Advice	15
Experience	14
Opportunities	14
Role Model	14
Success, Succeed	13
Assistance	11
Academic Development	10
Reference, Resource, Someone to go to for information	10
Development	9
Listening	9
Support	9
Encouraging/Encouragement	8
Process	8
Interaction	7
Relationship	7
Research	5
Respect	4
Communication	3
Counseling	3
Non-judgmental	3
Trust	3
Available	2
Coaching	2
Confidence	2
Facilitate	2
Feedback	2
Individuals with less experience	2
Individuals with more experience	2
Teaching	1

The third most popular phrase used was "career development" (n = 22). Three examples of how the phrase was used to define undergraduate mentoring are:

- "Providing assistance, counseling, and a model for career development."
- "An undergraduate mentor provides opportunities for students to learn new career development skills. Experience and exposure to new concepts is an important part of mentoring. A mentor can provide a sequential learning experience to build on the base of knowledge."
- "Beyond the usual advice, becoming actively engaged in professional and career development. To the extent that personal development is connected to the above items, you must be able to relate personally as well."

The terms that were used the least in the definitions were communication (n = 3), counseling (n = 3), nonjudgmental (n = 3), trust (n = 3), available (n = 2), coaching (n = 2), confidence (n = 2), facilitate (n = 2), and feedback (n = 2), individuals with less experience (n = 2), and individuals with more experience (n = 2). *Teaching* was used only once to define undergraduate mentoring.

Mentoring Functions and the Extent Practiced

Section two of the questionnaire was designed to determine which mentoring functions were practiced and the extent to which each function was practiced by faculty in the College of Agriculture at Iowa State University (objective three). The six mentoring functions examined were informal contact, role modeling, direct assistance, demonstration, observation and feedback, and professional development assistance (for a brief description of the functions, see chapter 2 pages 19-21). Respondents were asked to identify the extent to which they practiced each item based on the following scale: 1 = Never, 2 = Sometimes, 3 = Often 4 = Always.

Informal Contact

As shown in Table 7, the informal contact function item, *As a mentor, I keep feelings and doubts my students have shared with me in strict confidence*, had the highest mean value (3.78) (*SD* = .53). The item, *As a mentor, I interact with my students socially outside of work*, received the lowest mean value (*M* = 1.99), and had standard deviations of .60.

Table 7. Distribution of means and standard deviations of the informal contact function according to faculty in the College of Agriculture at Iowa State University (*n* = 188)

Informal Contact Function Items	n	Mean	SD
As a mentor I . . .			
keep feelings and doubts my students have shared with me in strict confidence.	187	3.78	0.53
am easy to approach when my students have questions.	188	3.47	0.61
show interest in my students' activities outside of work (e.g. academics, extra curricular activities, etc.).	188	3.00	0.74
am available outside of working hours for help.	187	2.74	0.80
interact with my students socially outside of work.	188	1.99	0.60

Scale: 1 = Never, 2 = Sometimes, 3 = Often, 4 = Always

Role Modeling

Four of the five role model function items had mean values greater than 3.00. The statement, *As a mentor, I model the work behavior I expect my students to imitate*, had the highest mean value (3.89) and a standard deviation of .69. The only item that had a mean value less than 3.00 was, *As a mentor, I believe my students will strive to be like me if they obtain a similar career* (*M* = 2.24; *SD* = 0.81). Table 8 displays the means and standard deviations of the role model function items.

Table 8. Distribution of means and standard deviations of the role model function according to faculty in the College of Agriculture at Iowa State University (n = 188)

Role Model Function Items	n	Mean	SD
As a mentor I . . .			
model the work behavior I expect my students to imitate.	188	3.89	0.69
display professionalism while on the job.	187	3.73	0.50
exhibit commitment to my students' educational/career growth and development.	188	3.56	0.56
demonstrate realistic ways of solving problems.	188	3.41	0.57
believe my students will strive to be like me if they obtain a similar career.	185	2.24	0.81

Scale: 1 = Never, 2 = Sometimes, 3 = Often, 4 = Always

Direct Assistance

The item, *As a mentor, I convey empathy for the concerns my students have discussed with me* (M = 3.12; SD = 0.70) was the only direct assistance function item that had a mean over 3.00 (Table 9). The other four items had means lower than 3.00 with the lowest mean (M =.60; SD = 0.88) belonging to the statement, *As a mentor, I encourage my students to talk openly about anxiety and fears that detract them from their work.*

Table 9. Distribution of means and standard deviations of the direct assistance function according to faculty in the College of Agriculture at Iowa State University (n = 188)

Direct Assistance Function Items	n	Mean	SD
As a mentor I . . .			
convey empathy for the concerns my students have discussed with me.	187	3.12	0.70
help my students meet new colleagues in the department.	188	2.82	0.76
share personal experiences as an alternative perspective to my students' problems.	187	2.74	0.70
give my students responsibilities that increase personal contact with other individuals on and off campus.	186	2.73	0.77
encourage my students to talk openly about anxiety and fears that detract them from their work.	187	2.60	0.877

Scale: 1 = Never, 2 = Sometimes, 3 = Often, 4 = Always

Demonstration

Table 10 shows the means and standard deviations of the demonstration function items. Four of the five items had means greater than 3.00. The statements, *As a mentor, I demonstrate effective listening skills in conversations with my students*, and *I encourage my students to prepare for career advancement*, had a mean value of 3.34 (*SD* = 0.64 and *SD* = 0.69 respectively). The demonstration item, *As a mentor, I share history of my career with my students*, had the lowest mean value (2.87) and a standard deviation of .73.

Table 10. Distribution of means and standard deviations of the demonstration function according to faculty in the College of Agriculture at Iowa State University (*n* = 188)

Demonstration Function Items	n	Mean	SD
As a mentor I . . .			
demonstrate effective listening skills in conversations with my students.	186	3.34	0.64
encourage my students to prepare for career advancement.	188	3.34	0.69
share ideas with my students about their projects.	188	3.21	0.67
suggest specific strategies for accomplishing project goals.	188	3.10	0.68
share history of my career with my students.	188	2.87	0.73

Scale: 1 = Never, 2 = Sometimes, 3 = Often, 4 = Always

Observation and Feedback

The observation and feedback function had three items with a mean over 3.00. The item, *As a mentor, I convey feelings of respect for my students as individuals*, had the highest mean value (3.64) and a standard deviation of .56. The statement, *As a mentor, I encourage my students to try new ways of behaving on the job*, had the lowest mean value (2.50) and a standard deviation of .79. Table 11 displays the means and standard deviations of the observation and feedback function items.

Table 11. Distribution of means and standard deviations of the observation and feedback function according to faculty in the College of Agriculture at Iowa State University (n = 188)

Observation and Feedback Function Items	n	Mean	SD
As a mentor I . . .			
convey feelings of respect for my students as individuals.	187	3.64	0.56
encourage my students to explore alternatives rather than just providing solutions.	187	3.16	0.66
provide suggestions concerning current problems my students encounter.	187	3.04	0.69
provide my students with objective feedback by citing specific examples.	185	2.88	0.65
encourage my students to try new ways of behaving on the job.	183	2.50	0.79

Scale: 1 = Never, 2 = Sometimes, 3 = Often, 4 = Always

Professional Development Assistance

As displayed in Table 12, the item, *As a mentor, I provide my student with support regarding their performances*, was the professional development assistance function item with the highest mean value (M = 3.11; SD = .66). The statement with the lowest mean value was *As a mentor I help my students clarify their career goals* (M = 2.94; SD = .75).

Table 12. Distribution of means and standard deviations of the professional development assistance function according to faculty in the College of Agriculture at Iowa State University (n = 188)

Professional Development Assistance Function Items	n	Mean	SD
As a mentor I . . .			
provide my students with support regarding their performances.	185	3.11	0.66
provide my students with assistance on how to solve problems they may face on the job.	188	3.00	0.73
give assignments to my students that presents opportunities to learn new skills.	188	2.99	0.72
speak highly of my students' abilities and skills to others.	188	2.96	0.66
help my students clarify their career goals.	187	2.94	0.75

Scale: 1 = Never, 2 = Sometimes, 3 = Often, 4 = Always

To determine the overall extent to which each mentor function was practiced, a composite score was formed for each function by grouping the means of the five items for each function. The composite scores were measured on the following scale: 0 to 1.49 = Never, 1.50 to 2.49 = Sometimes, 2.50 to 3.49 = Often, 3.50 to 4.00 = Always. The composite scores for each mentor function were greater than 2.50 indicating that respondents practiced these functions "often". The role modeling function had the highest composite score value of 3.27, and the direct assistance function had the lowest composite score value (2.80) of the six functions. Table 13 displays the composite mentor function scores.

Table 13. Composite scores of the six mentor functions according to faculty in the College of Agriculture at Iowa State University (n = 188)

Mentor Function	n	Composite Score	Extent
Role Modeling	188	3.27	Often
Demonstration	188	3.17	Often
Observation and Feedback	188	3.05	Often
Professional Development Assistance	188	3.00	Often
Informal Contact	188	3.00	Often
Direct Assistance	188	2.80	Often

Scale: 1 = Never, 2 = Sometimes, 3 = Often, 4 = Always

Comparisons of Mentoring Functions Practiced Among Selected Demographic Variables

In this section, respondents were grouped by selected demographic variables to compare mentoring function composite scores for the six mentor functions. The selected groups were: faculty title, department, responsibility area, and faculty age. Analysis of variance (ANOVA) was used to identify statistically significant differences among these groups. An alpha level of .05 was set a priori.

To determine if differences existed in the way each mentor function was practiced across faculty title, the three most common titles, professors, associate professors, and assistant professors, were compared. Statistically, no significant differences in the mentoring functions practiced by professors, associate professor, or assistant professors were found (Table 14).

Table 14. Means, standard deviations and F-values of the mentor function composite scores by faculty title

	Full Professor (n = 150)		Associate Professor (n = 92)		Assistant Professor (n =60)			
Function	Mean	SD	Mean	SD	Mean	SD	F-value	p-value
Informal Contact	2.98	0.40	3.04	0.33	2.97	0.43	0.74	0.479
Role Modeling	3.28	0.47	3.30	0.36	3.22	0.41	0.55	0.580
Direct Assistance	2.86	0.56	2.76	0.56	2.77	0.64	1.06	0.349
Demonstration	3.15	0.49	3.21	0.51	3.13	0.54	0.54	0.585
Observation and Feedback	3.02	0.46	3.04	0.52	3.12	0.46	0.96	0.384
Professional Development Assistance	2.98	0.51	3.00	0.54	2.97	0.54	0.08	0.927

Mentoring function composite scores were also compared among the 15 College of Agriculture departments at Iowa State University. The 15 departments were classified into four groups: Biological Sciences, Social Sciences, Plant & Environmental Sciences, and

Biosystems/Pre-Vet. When composite scores for the six mentor functions were compared among these four groups, no statistically significant differences were observed (Table 15).

Table 15. Means, standard deviations and F-values of the mentor function composite scores by department

	Biological Sciences (n = 16)		Social Sciences (n = 34)		Plant & Environment Sciences (n = 59)		Biosystems/ Pre-Vet. (n = 72)			
Function	Mean	SD	Mean	SD	Mean	SD	Mean	SD	F-value	p-value
Informal Contact	3.09	0.33	2.95	0.42	2.93	0.40	3.05	0.38	1.48	0.222
Role Modeling	3.41	0.49	3.24	0.39	3.22	0.49	3.30	0.40	0.99	0.400
Direct Assistance	2.85	0.58	2.81	0.39	2.66	0.57	2.86	0.54	0.89	0.448
Demonstration	3.19	0.45	3.12	0.52	3.06	0.55	3.38	0.45	1.67	0.175
Observation and Feedback	3.19	0.51	2.99	0.53	3.02	0.52	3.05	0.36	0.76	0.520
Professional Development Assistance	3.09	0.55	2.89	0.54	2.98	0.52	3.05	0.51	0.87	0.458

To determine if differences existed in the way each mentor function was practiced across responsibility area, faculty with primary extension, teaching, and research appointments were compared. ANOVA tests revealed that there were no statistically significant differences in the practice of the six mentoring functions based on faculty responsibility area (Table 16).

Table 16. Means, standard deviations and F-values of the mentor function composite scores by responsibility area

	Extension (n = 24)		Teaching (n = 45)		Research (n = 95)			
Function	Mean	SD	Mean	SD	Mean	SD	F-value	p-value
Informal Contact	2.99	0.36	3.08	0.37	2.98	0.41	1.12	0.330
Role Modeling	3.30	0.39	3.27	0.40	3.29	0.44	0.04	0.956
Direct Assistance	2.63	0.53	2.96	0.52	2.78	0.57	2.96	0.055
Demonstration	3.11	0.38	3.16	0.49	3.16	0.53	0.12	0.885
Observation and Feedback	2.93	0.42	3.06	0.47	3.06	0.46	0.91	0.406
Professional Development Assistance	2.96	0.44	3.05	0.52	2.98	0.54	0.37	0.693

The last group comparison was based on the age of the faculty. The three age categories formed were: 27 to 40 years, 41 to 60 years, and 61 to 80 years. Analysis revealed that there were no statistically significant differences when composite scores for the six mentoring functions were compared to the age of faculty members (Table 17).

Table 17. Means, standard deviations and F-values of the mentor function composite scores by faculty age

	27 to 40 years (n = 29)		41 to 60 years (n = 130)		61 to 80 years (n = 15)			
Function	Mean	SD	Mean	SD	Mean	SD	F-value	p-value
Informal Contact	3.03	0.35	2.98	0.39	3.07	0.45	0.52	0.595
Role Modeling	3.21	0.39	3.29	0.43	3.32	0.53	0.41	0.662
Direct Assistance	2.77	0.43	2.81	0.58	2.88	0.64	0.19	0.824
Demonstration	3.06	0.41	3.18	0.51	3.05	0.54	0.93	0.396
Observation and Feedback	2.97	0.43	3.07	0.46	2.97	0.43	0.83	0.437
Professional Development Assistance	2.94	0.50	3.00	0.52	3.00	0.55	0.14	0.869

Mentor Training and Professional Development

The respondents were asked to report any formal training they had previously received on the mentoring process. Eighty-seven percent of the respondents said that they had not had any formal training on the mentoring process, and 13% said that they had received some sort of formal training. The majority of the respondents that claimed to have had training on mentoring received it from faculty mentoring programs, mentoring for P & T (Promotion and Tenure), and through student advising, professional development, or academic affairs and student services updates. Other training received consisted of attending workshops such as programs on mentoring through the USDA, National Mentor Training

from Boys and Girls Clubs of America, and mentor training from the United Way. Respondents also received training by taking formal graduate courses as graduate students, being a 4-H leader, or from being a Peace Corps volunteer. Only two respondents received training while working in the agriculture industry.

Only 18.2% of the respondents reported they had been offered professional development related to mentoring while employed by Iowa State University. Approximately 53% of the respondents were interested in receiving professional development related to mentoring if Iowa State University were to offer it. Topics respondents were interested in receiving professional development for were: mentoring strategies, motivating and engaging students, career development assistance, expectations, student goals, and counseling. The respondents were interested in techniques of how to be a successful mentor and learning the difference in mentoring strategies between mentoring individuals and groups. Respondents were interested in learning how to motivate students to take ownership of what they do and how to assist a student in becoming established in a career. Expectations of a mentor and protégé, and suggestions on how to help students with setting and attaining goals were also areas of interest to the respondents. Lastly, respondents wanted to know tips on counseling students with academic, financial, and/or personal struggles (e.g. drug and alcohol addiction).

Respondents gave suggestions for the delivery of professional development on mentoring. They proposed organizing information-based workshops or seminars that last one hour or have two sessions. They suggested focusing on mentoring strategies and resources, or having experienced mentors speak about the basics of mentoring. It was also requested that a list of contacts for dealing with problems outside of faculty expertise (e.g. counseling, safety issues, etc.) be developed.

CHAPTER V. DISCUSSION

The purpose of this study was to determine the perceptions of the faculty in the College of Agriculture at Iowa State University regarding undergraduate mentoring. Specifically, the study sought to determine the mentoring functions practiced by faculty and to what extent to which they were practicing mentoring functions. This chapter presents a discussion of the findings of this study based on the following objectives:

1. Describe demographic characteristics of the faculty participants.
2. Determine faculty perceptions about mentoring.
3. Determine the mentoring functions practiced and the extent to which they are practiced by faculty in the College of Agriculture.
4. Compare the mentoring functions practiced among selected demographic variables.

Demographic Characteristics

Most mentoring studies have taken place in business and industry (Fagenson-Eland, 1989; Orpen, 1995; Scandura, 1992), while few studies about mentoring have focused on education (Merriam et al., 1987; Anderson et al., 1995). However, educational mentoring studies have primarily researched faculty to faculty mentoring or faculty to graduate student mentoring causing a deficiency in studies conducted at the undergraduate level (Merriam et al., 1987). The few undergraduate mentoring studies that have been done focused on the protégés' perceptions about their mentor or mentoring relationship (Anderson et al.; McCarthy & Mangione, 2000; Van Ast & Field, 2005). Jones (1985) and Eastman (1988) surveyed agricultural education faculty at Iowa State University regarding cognitive skill development, and mentoring and career development, respectively. However, these studies focused on the perceptions of agricultural education faculty as protégés. Further, there has

been no evidence of mentoring studies conducted within an institution's *entire* College of Agriculture faculty.

In contrast with previous research, one objective of this study was to determine demographic characteristics of the faculty in the entire College of Agriculture at Iowa State University as mentors not protégés. The respondents were primarily Full Professors (39.9%), Associate Professors (24.5%) and Assistant Professors (15.9%). While only one respondent held the title of Instructor, all seven faculty titles were represented. Jones (1985) and Eastman (1988) found similar results in their study. Jones reported an academic rank break-down of 40% full professors, 30% associate professors and 29% assistant professors. Eastman reported 44% full professors, 35% associate professors, and 20% assistant professors.

Respondents were predominately from the departments of Agronomy (18.5%) and Animal Science (15.8%) with only one (0.5%) respondent from the department of Genetics Development and Cell Biology (GDCB). However, each College of Agriculture department was represented. The respondents' primary responsibility was research (51.6%). Teaching was the primary responsibility of 24.2% of the respondents and extension was the primary responsibility of 13.4% of the respondents. Jones (1985) also reported that the primary responsibility of respondents in his study was budgeted to research in agricultural education.

The average number of years employed by Iowa State University was 15.4 years. Forty-one percent of the respondents were employed between one to ten years. Respondents were primarily 51 to 60 years old (41.2%) with the average age being 49.9 years. There were three respondents under 30 years of age and three respondents in the 71 to 80 years category.

Similarly, Eastman (1988) reported that respondents had an average age of 45.3 years, and an age range of 28 to 68 years.

Respondents primarily mentored undergraduate student employees (25.4%) and advisees (16.5%), and fewer respondents mentored students in the Science With Practice program (4.2%) and learning communities (3.8%). These results seem logical considering that half (51.6%) of the respondents' primary responsibility was research. This data indicates that there would be more interaction with student employees assisting with research. In fact, hundreds of undergraduate students are employed throughout the College of Agriculture at Iowa State University (Adcock, 1996). In the summer of 1996 the animal science department had 135 hourly student employees and the plant pathology department employed 29 hourly students (Adcock). Additionally, Science With Practice is a new program in the College of Agriculture at Iowa State University and would be expected to have fewer students mentored than other groups. Since the program's debut in the spring of 2005, 53 students and 40 College of Agriculture faculty/staff mentors have participated.

Learning communities was one of the groups fewer respondents mentored because there are only 15 learning communities in the College of Agriculture (Iowa State University, 2005_a). Though a faculty member may be an advisor/coordinator of a learning community, peer mentors, who are qualified upper classmen, play the primary mentoring role.

Faculty also indicated a variety of other groups they mentored. The groups included undergraduates in classroom and laboratory sections, mock and exit interviews, competitive teams (e.g. livestock judging), undergraduate research assistants, students in the Freshman Honors program, Life in Iowa program, PWSE (Program for Women in Science and Engineering), and Agronomy Endowment Undergraduate Professional Development

Research Fellowship students. It is possible that some aspects of mentoring occur in these groups between faculty and students. However, faculty may be confusing their role as an advisor or teacher with the role of a mentor. Anderson et al. (1995) reported that mentors often have difficulty distinguishing the difference between mentoring and student-faculty interaction or advising.

Faculty reported that they spent one half hour to 50 hours per week interacting with undergraduate students. On average, the respondents spent 9.12 hours interacting with students per week, and considered that they actually mentor, on average, for 4.96 of these hours. The hours spent mentoring students ranged from zero to 50 hours. These results indicate that some respondents did not feel that their time spent with undergraduate students is mentoring. On the other hand, some respondents considered anytime spent with students to be mentoring. This information further supports Stanley and Lincoln's (2005) finding that faculty and administrators are often uncertain about how to foster effective mentoring relationships with undergraduates. The uncertainty of whether or not Iowa State University College of Agriculture faculty's time spent with students was actually spent mentoring suggests that the faculty may also be uncertain on how to foster effective mentoring relationships with undergraduates. Those mentors who reported that they mentored zero hours, actually may have been mentoring, but just were not aware that they were. Likewise, faculty who reported they mentored every hour they interacted with students may not have been because they may not have known the specific elements that are included in mentoring.

Perceptions of Mentoring

The second objective of this study was to determine the 2006 Iowa State University College of Agriculture faculty's perceptions about mentoring. Faculty were asked to indicate the extent to which they agreed with 25 statements regarding mentoring based on a 5-point Likert-type scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). Overall, the respondents agreed with 12 statements, were neutral on 11 statements, and disagreed with two statements about the mentoring process. The overall mean of the 25 mentoring items was 3.46 (*SD* = .613). These findings are a good indication that the respondents are slightly uncertain about how to describe the mentoring process.

Respondents agreed that mentoring is a systematic process that involves exchanging information, career development assistance, and counseling a protégé. The respondents believed that mentors play many roles, are an information source, demonstrate exemplary job skills and strategies for accomplishing goals, assist protégés in developing a sense of professional identity, and observe protégés' performances. They also believed that mentoring is a skill that requires training, and that mentors should be active in the mentoring process and not passive.

There were 11 statements for which respondents indicated neutral responses. Faculty neither agreed nor disagreed that mentoring consists of frequent informal conferences, is a socialization process, or is based on friendship. According to Kram (1985), relationships that have substantial interpersonal intimacy have considerable meaning and significance to both individuals in a mentorship situation. However, she also reported that most mentors prefer to restrain from informal social interaction outside of work because it allows the mentor to "evaluate and judge their protégé without being guilty or ambivalent" (p. 39). Perhaps

respondents in this study agreed with Kram, that a mentor should not get too close to the protégé for fear the mentor will not be honest or fair in evaluations. However, respondents also agreed that some degree of friendship should be allowed.

Likewise, respondents neither agreed nor disagreed that mentoring is a relationship between an older, more experienced person and a younger, inexperienced person, or similarly, that mentors have a greater intellectual status than protégés. Levinson et al. (1978) stated that mentors are typically about one and one-half generations (eight to fifteen years) older than their protégés. Eastman (1988) reported a mean age difference of 16 years usually existed between mentors and protégés, and that mentors typically held higher degrees than their protégés. However, having a mentor relationship where the protégé is the same age or older than the mentor is possible, especially since more and more individuals are changing careers or returning to school at midlife. In this case, it is also possible that mentors have different educational backgrounds or even less education than their protégés. It is possible that the respondents in this study believed that age and intellectual status were not factors determining who can mentor or be mentored. There may be instances where individual respondents have mentored an individual older than themselves.

Respondents were also undecided as to whether mentors serve as advocates or sponsors for protégés, are role-specific models in their disciplines, or if mentors that are chosen by protégés are more effective than assigned mentors. This information indicated that the respondents were unsure how a mentor can be a sponsor to a student. Kram (1985) described sponsorship as being a resource for a protégé during the beginning of a new project, career, or promotion. Sponsoring a protégé could be as basic as writing a letter of reference for a student. Respondents were also unsure if a mentor is a role-specific model in

their discipline. It is possible that faculty realize that mentoring is not constrained to teaching or training a student in their specific discipline, it's also giving them advice or counseling in areas outside their subject matter. Furthermore, the respondents were undecided if mentors chosen by protégés are more effective than assigned mentors. Fagenson-Eland et al. (1997) concluded that mentors in assigned relationships may provide less mentoring than mentors in informal mentoring relationships. However, Noe (1988) found that protégés perceived greater psychosocial benefits and career-related support in assigned mentoring relationships. This issue continues to generate mixed results.

Though respondents agreed that mentors should be active in the mentoring process, they were indifferent as to who should lead the mentoring process. The respondents neither agreed nor disagreed with the statements, *The best mentors are directive in the process* and *The protégé should lead the mentoring process.* It is possible that faculty believe both mentors and protégés share roles in initiating the mentoring process.

There were only two statements with which the respondents disagreed. The statements were: *Mentoring is a casual, laid back process of giving advice* and *Mentoring is the same as academic advising.* This finding indicated the respondents believed that a mentor's role is serious and consists of more than just casually handing out advice. This also indicated the respondents believed there is a difference between mentoring and academic advising. In fact, one respondent in this study offered the following statement as a suggestion for a professional development program on mentoring:

> I want to be trained to be a mentor and not an advisor. An advisor is one who should handle degree audits and the paperwork associated with a student's career here at ISU. I want to be a mentor helping students plan ahead for a lifetime career. (Anonymous)

The respondent's suggestion supported the idea the academic advising is a one-way street and mentoring is a two-way street. In academic advising, the advisor simply provides the student with information about their academic career. Follow-up is usually not performed and the students provide their advisor with few updates. In mentoring relationships, information should flow from mentor to protégé; the student asking questions and the mentor providing feedback. However, with only one respondent capable of distinguishing a difference between mentoring and academic advising, it is likely the majority of the faculty were confusing the two concepts.

Definitions of Undergraduate Mentoring

In addition to determining faculty's perceptions of mentoring, respondents were asked to provide their own definition of undergraduate mentoring. Many studies have attempted to define *mentoring* or *mentor* (Levinson et al., 1978; Kram, 1985; Olian et al., 1988; Fagenson-Eland, 1989; Moses, 1989). Jacobi (1991) found fifteen diverse attempts to operationally define mentoring, and Stanley and Lincoln (2005) reported that a mentor has commonly been described as a coach, a guide, a counselor, a role model, a peer advisor, and/or a sponsor. In this study, respondents provided 126 definitions of undergraduate mentoring. Three terms/phrases appeared repeatedly in the definitions – guide/guiding/guidance (26 occurrences), personal, academic, and career/professional development (25 occurrences), and career development (22 occurrences).

Respondents used the terms, guide/guiding/guidance, to express that undergraduate mentoring is not about making decisions for students; rather it's guiding them down the path so they can make decisions for themselves, or guiding them in defining their future goals.

Respondents who used the terms personal, academic, and career/professional development together to define undergraduate mentoring, appeared to agree that undergraduate mentoring is not only assisting students academically or with career/professional development, but also in personal development. Consistent with Kram (1985), she described personal development as assisting a protégé with increasing their sense of competence and self-worth.

The third most popular phrase the respondents used was career development. Though career development was a component of the second most common occurring phrase, the respondents who used the phrase "career development" alone appeared to believe that undergraduate mentoring is providing students with opportunities or exposure to new concepts that enhance career development skills.

Other terms respondents commonly used to define undergraduate mentoring were goals, advice, experience, opportunities, role model, success/succeed, and assistance. The terms that were used the least in the definitions were research, respect, communication, counseling, nonjudgmental, trust, available, coaching, confidence, facilitate, feedback, individuals with more experience, and individuals with less experience. Teaching was used only once to define undergraduate mentoring. Merriam (1983) reported that in education, a mentor is a friend, a guide, a counselor, and above all, a teacher. Furthermore, she discovered in her review of mentoring studies that in educational settings there is a failure to reveal a clear notion of how a mentor is different from an influential teacher. Based on their definitions, respondents in this study may see teachers as having a more of a directive role, such as in the delivery of a lecture, and a mentor as more of a passive role, such as guiding the protégé in decision making.

The terms and phrases identified in this study to define undergraduate mentoring were similar in some respects yet different in others to the terms used in the definitions Jacobi (1991) found in her review of mentoring literature. Jacobi identified seven components of mentoring about which respondents and researchers have strong agreement. The components Jacobi identified were:

1. Achievement – assisting a protégé to succeed by setting proper goals
2. Emotional and psychosocial support
3. Direct assistance with career and professional development
4. Role modeling
5. Both the mentor and protégé benefit from the relationship
6. Personal Development
7. Mentors have greater experience, influence and achievement compared to the protégé

Respondents in this study seemed to agree with the first of Jacobi's components, that mentoring is based on assisting a protégé with setting goals and ultimately helping them succeed. Terms relating to goals or goal setting were used 17 times as an aspect of undergraduate mentoring. Furthermore, there were 13 definitions that described undergraduate mentoring as helping the student succeed.

Role modeling was also a component about which respondents agreed. Jacobi (1991) concluded that nearly all the definitions reviewed indicated that role modeling is a major function of undergraduate mentoring. The respondents of this study agreed with Jacobi's findings. Role modeling was used 14 times to describe undergraduate mentoring.

Respondents also concurred with the third and sixth components. Respondents appeared to agree that undergraduate mentoring has a great deal to do with career and

professional development. The phrase was used separately and in conjunction with academic and personal development as two of the most common terms/phrases used to define undergraduate mentoring in this study. A majority of the respondents agreed with the sixth component, personal development, as well because it was included 25 times in a phrase with academic and career development. In support of assistance with personal development, Jacobi (1991) reported that mentoring should include the exchange of information beyond that of academics and career development, as long as confidentiality is not violated, in order to increase a protégé's sense of competence and self-worth.

Respondents seemed to somewhat disagree with the remaining three components; emotional and psychological support, both the mentor and protégé benefit from the relationship, and mentors have greater experience, influence and achievement compared to the protégé. Kram (1985) described emotional support as listening and counseling at times when the protégé is struggling or in a conflict. She described psychological support as encouragement and building up of one's confidence. In this study, respondents did not seem to believe emotional and psychological support were as important as some aspects because they used the terms listening, encouragement, counseling and confidence less frequently than many other terms to define undergraduate mentoring.

Kram (1985) indicated that a major misconception of mentoring is that the primary beneficiary in a mentoring relationship is not only the protégé. Likewise, in component five, Jacobi (1991) reported that mentoring has shared benefits (either emotional or tangible) between the mentor and protégé. For example, Kram (1985) indicated several ways mentors can benefit from a mentoring relationship (e.g. delegating challenging tasks to protégés can relieve the mentor of the duty, but provide the protégé with exposure to career specific

duties). However, mentors continue to view mentoring as one-dimensional (only benefiting the protégé). Respondents in this study reflect such statements. No respondents mentioned that mentoring can benefit both individuals in a mentorship situation in their definitions. It is possible to conclude that the respondents of this study had a one-dimensional view of mentoring and were unaware of how they (as a mentor) can benefit from mentoring students.

Lastly, Jacobi (1991) found that mentoring was commonly defined as a relationship between a mentor, who is older and shows greater experience, influence and achievement within a particular position, and a protégé, one who is younger and not as established in such a position. Only two respondents of this study appeared to agree. Perhaps respondents left out such a component because they assumed that in undergraduate mentoring the mentor is usually a faculty member mentoring a typical 18-24 year old undergraduate student. Non-traditional students who can be the same age as faculty members defeat this idea, of course, but are not common.

Given the variety of terms this study and many others used to define mentors or mentoring, one would assume a common definition could be formed. However, the review of definitions from this study and other attempts to define mentoring still support Merriam's (1983) contention that "mentoring appears to mean one thing to one person, another to another person, and a third thing to another" (p. 169). Though there might not be a single, precise way to define mentoring, this study has brought more awareness of the descriptors of undergraduate mentoring. Using the descriptors, undergraduate mentoring can be defined as a developmental relationship between a more advanced or experienced person (a mentor, typically a faculty member), who serves as a guide, to another individual (a protégé, typically an undergraduate student), who receives assistance with career, personal and academic

development. The support a mentor provides can help the protégé transition from childhood to adulthood, from student to professional or employee to employer. The above definition seems to capture the essence of the definitions offered by College of Agriculture faculty in this study.

Mentoring Functions and the Extent Practiced

Objectives three and four of this study were to determine the mentoring functions practiced and the extent to which each function was practiced by Iowa State University College of Agriculture faculty. Respondents were asked to identify the extent to which they practiced each item on a 4-point Likert-type scale (1 = Never, 2 = Sometimes, 3 = Often, 4 = Always). Thirty items on the questionnaire represented the six mentoring functions: informal contact, role modeling, direct assistance, demonstration, observation and feedback, and professional development assistance. A composite score (means from the five items that represented each function) was formed in order to determine the extent to which each mentor function was practiced by the respondents. The composite scores of each function were greater than 2.50 indicating the respondents practiced these functions *often*.

Role Modeling

Actual composite scores revealed that faculty were practicing role modeling (composite score = 3.27) to a greater extent than any of the other functions. Kram (1985) claimed that role modeling was the most frequently reported psychosocial function. Her description of a role model was someone whose attitudes, values, and behaviors provide a standard for protégé to emulate. In more detail, Brzoska et al. (1987) described role modeling as exhibiting professionalism, showing the protégé how to do things properly, demonstrating realistic ways of problem solving, and showing enthusiasm and self-confidence. Respondents

in this study believed they were modeling work behavior they expected their students to imitate, were displaying professionalism, and were exhibiting commitment to their students' educational/career growth and development to a high extent. Respondents felt they were *often* demonstrating realistic ways of solving problems, and only slightly agreed their students may strive to be like them if their students were to obtain a similar career.

It is likely that role modeling was the most frequently reported mentoring function because the respondents were perhaps unaware of their ability to provide other mentor functions such as observation and feedback. The respondents may have considered most of their actions and behaviors around students as role modeling. It is possible that the respondents overlooked knowledge acquisition. Students not only learn indirectly from observing and listening to their mentors in everyday classroom or research situations, but also in more direct situations such as from their mentor's feedback or assistance with goal setting.

Demonstration

The demonstration function is exercised when the mentor shows the protégé how to properly use a specific strategy, technique, or skill (Brzoska et al., 1987). The demonstration function involves the mentor displaying proper skills and strategies for students to observe and decide how to use on their own. In this study, the respondents believed they were *often* providing the demonstration function by demonstrating effective listening skills in conversations with students, encouraging students on how to prepare for career advancement, sharing ideas with students about their projects, suggesting specific strategies for accomplishing project goals, and sharing the history of their career with students. For career

advancement, this may mean mentors need to demonstrate how to prepare a résumé and develop interview skills.

Observation and Feedback

Edwards and Protheroe (2004) reported that mentors were often focusing feedback on "descriptive reiterations" of observed events. This type of feedback was strongly discouraged because it does not identify what needs to be improved, nor if any of the protégés' actions were actually correct. Brzoska et al. (1987) recommended having a pre-conference, an observation, and a post-observation conference when observing and providing feedback. This process allows mentors and protégés time to identify goals and then review and analyze the situation in order to recognize accomplishments and make recommendations for improvement. Respondents in this study *often* encouraged their students to explore alternatives rather than just providing them with solutions, provided suggestions concerning current problems their students encountered, provided their students with objective feedback by citing specific examples, and encouraged their students to try new ways of behaving on the job. These results suggest the respondents understood how to properly observe their students and give constructive feedback.

Brzoska et al. (1987) also advised that trust and support will be enhanced and anxiety reduced if a mentor provides positive feedback. In this study, respondents believed they *always* conveyed feelings of respect for their students as individuals when observing performances and providing feedback. According to Brzoska et al., showing respect and remaining nonjudgmental indicates the respondents were taking steps to building trust and support in their mentoring relationships.

Professional Development Planning Assistance

Brzoska et al. (1987) suggested that mentors should serve as resources to provide protégés with any information or opportunities for potential careers or further education. It has been reported that mentors are crucial in increasing a protégé's intellectual development and career identity (McCallum, 1980). Anderson et al. (1995) identified several predictors of student academic success (measured by GPA). One strong predictor was that the faculty mentor provided an environment of intellectual challenge and stimulation. In the current study, respondents reported they *often* provided their students with support regarding performances, assisted their students on how to solve problems they may face on the job, gave assignments to their students that presented opportunities to learn new skills, and helped their students clarify career goals. It is possible that the mentoring process can provide a student with the help needed to create clearly stated goals. Further, the guidance of a mentor may help students achieve their goals. According to mentoring literature, faculty in this study believe they are practicing the professional and career development function appropriately.

Additionally, Anderson et al. (1995) reported that the strongest predictor of academic success (measured by GPA) was a faculty member writing a letter of recommendation for their student for a job or graduate school. Similarly, faculty in this study reported *often* speaking highly of their students' abilities and skills to others. It is possible that the mentoring provided by faculty in this study contributed to the career and academic success of students mentored at Iowa State University.

Informal Contact

Informal contact is interactions or discussions that take place outside the scheduled meeting sessions of the mentoring process (Brzoska et al., 1987), or interactions that involve

personal concerns that are not directly connected to work-related endeavors. Kram (1985) indicated that mentored individuals will have personal concerns about self, career, and family that can detract them from effective work or education. In this case, counseling may relieve these concerns. Further, social interactions outside of work can have considerable meaning and significance to both individuals in a mentorship. Respondents in this study *always* kept feelings and doubts their students shared with them in strict confidence. Respondents *often* believed they were easy to approach when their students had questions, showed interest in their students' activities outside of work (e.g. academics, extra curricular activities, etc.), and were available outside of working hours for help. Respondents also indicated that they only *sometimes* interacted with their students socially outside of work. Kram (1983) indicated that mentors who frequently engaged in informal social interactions outside of work with their protégés often felt guilty or ambivalent when evaluating their protégé. It is likely that faculty believe a mentor relationship should not be mistaken strictly as a friendship. Ultimately, these results indicate that respondents believed they are appropriately interacting with student protégés informally and providing sufficient counseling.

Direct Assistance

Brzoska et al. (1987) recommended that mentors should directly assist their protégé by: assisting them with setting and achieving goals, helping them organize and manage materials or equipment, suggesting techniques on how to keep records or to reflect in order to make improvements, helping them become aware of written and unwritten rules, informing them of workshop opportunities, and introducing them to other staff members. Respondents reported that they *often* helped their students meet new colleagues in the department or gave

their students responsibilities that increased personal contact with other individuals on and off campus.

Not only do mentors offer direct assistance by providing resources and opportunities for protégés to experience, but they can also offer assistance by directly listening to protégé's concerns and offering advice (Brzoska et al., 1987). In this study, respondents *often* conveyed empathy for the concerns their students discussed with them, shared personal experiences as alternative perspectives to their students' problems, and encouraged their students to talk openly about anxiety and fears that detract them from their work. Kram (1983) highly recommended sharing concerns in a mentorship situation because a mentor's similar experiences can offer much insight for overcoming protégés' concerns.

Summary of Mentoring Functions

Researchers have been unsuccessful in determining the "effectiveness" or "successfulness" of mentors because little is known about what mentoring functions are being practiced. Further, poor interpersonal skills and lack of competency on the mentor's part have been, to some degree, the origin of negative mentoring experiences. Determining what mentors are or are not doing, provides grounds for understanding what needs improvement based on the findings from mentoring research.

According to the literature and the overall mentor function composite scores of this study, faculty in the College of Agriculture at Iowa State University who responded to this questionnaire appeared to be appropriately practicing the six mentoring functions as presented in the Brzoska et al. (1987) Mentor Function Model. Kram (1985) and Fowler and O'Gorman (2005) indicated similar findings of the mentor functions practiced by mentors in organizational/business settings. However, Kram and Hall (1995) admitted that Kram's

Mentor Function Model is weak in the learning facilitation function, a function that focuses on meta-skills, self reflection, and collaborative learning according to Fowler and O'Gorman. Fortunately, the model used in this study appears to incorporate the learning facilitation function by combining principles of education with Kram's career and psychosocial mentoring functions. Therefore, the results of this study represent a thorough attempt to describe the dimensions of mentoring functions practiced in undergraduate education.

However, it should be noted that though the findings of this study indicate the respondents believed they practiced the behaviors suggested in the 30 mentor function items on the questionnaire, they may have been oblivious to the fact that these actions are actually considered mentoring. It is likely the respondents believed they were practicing such mentoring behaviors but failed to understand the significance of the mentoring functions. "The self-awareness of the connection between one's behavior and one's understanding of a behavior's significance has often been considered fundamental to one's metacognition – the ability to monitor one's current level of understanding and decide when it is not adequate" (Bransford, Brown, & Cocking, 2000, p. 47). The inability to understand thoughts ultimately influences behaviors. This concept is especially important in mentoring, because if a mentor is unaware of the impact their actions are having on a protégé, they may not be benefiting the protégé.

Comparisons of Mentoring Functions Practiced between Selected Demographic Variables

Mentoring ultimately focuses on adult development. However, in business settings mentoring is practiced with a career development perspective and in academic settings, mentoring is viewed from more of a learning experience perspective (Merriam, 1983). It is

likely that mentoring styles and techniques can vary from setting to setting. Similarly, it is possible that different disciplines possess diverse mentoring approaches. For example, faculty whose primary responsibility is teaching may mentor differently than those faculty who have a research responsibility. Research faculty may focus more on the benefit of research project and experiment results. In this case, the mentor relationship is likely to be high in role modeling and/or demonstration. On the other hand, teaching faculty tend to focus on human development and learning. It is possible that this type of mentoring relationship might be higher in direct assistance and/or observation and feedback.

To determine if differences in mentoring existed in this study, selected demographic variables were used to group faculty respondents to compare their mentoring function composite scores. Analysis of variance (ANOVA) was used to identify statistically significant differences among the following groups: title (full professor, associate professor, and assistant professor), age (27 to 40 years, 41 to 60 years, and 61 to 80 years), department (biological sciences, social sciences, plant & environmental sciences and biosystems/pre-vet), and responsibility (extension, teaching, and research).

When composite mentoring function scores were compared across academic title (full professors, associate professors and assistant professors), there were no statistically significant differences observed. Analysis also revealed that there were no statistically significant differences when composite scores for the six mentoring functions were compared across the age of faculty members. Likewise, Eastman (1988) found no statistically significant differences when composite mentoring scores were compared across academic ranks (full professor, associate professor, and assistant professor) or age among the mentors of agricultural education faculty.

Further, no statistically significant differences were observed in this study when composite scores for the six mentor functions were compared among the four groups of departments (biological sciences, social sciences, plant & environmental sciences and biosystems/pre-vet). Similarly, when grouped by responsibility area (extension, teaching, and research), there were, again, no statistically significant differences found.

The ANOVA tests revealed that there were no differences in the practice of mentoring functions regarding faculty title, age, responsibility, or departmental affiliation. These results indicate a very significant finding for teaching and learning within Iowa State University's College of Agriculture. Data suggested that there is tremendous consistency in the mentoring process practiced by the responding faculty in the College of Agriculture at Iowa State University. The uniformity among the groups supports the tradition a of quality faculty at Iowa State University. According to the Iowa State University Catalog (Iowa State University, 2005_c), several faculty members and various departments have been recognized nationally for their scholarly efforts. The culture of Iowa State University's faculty, especially faculty in the College of Agriculture, is focused on generating excellence in undergraduate, graduate and professional education. Inconsistency among mentoring practices would cause difficulty in accomplishing Iowa State University's mission of providing an educational environment for students to explore a variety of disciplines and career paths.

Mentor Training and Professional Development

The majority of the respondents (87%) reported that they had no formal training in mentoring, and 13% said they had received some sort of formal training. The respondents who had training indicated they received it from faculty mentoring programs, mentoring for

P & T (Promotion and Tenure), and through student advising professional development, or academic affairs and student services updates. Additionally, only 18.2% of the respondents reported they had been offered professional development related to mentoring while employed by Iowa State University.

It is disappointing that only about 10 percent of the respondents had received some form of mentoring training. It is possible that formal undergraduate mentoring professional development has never been offered at Iowa State University, and respondents considered the faculty or student advising professional development received to be undergraduate mentoring professional development. It could be argued that training in student academic advising could assist a professor in mentoring an undergraduate (e.g. experience in communicating with undergraduates). However, undergraduate mentoring is more than just assisting a student with a course schedule or explaining a degree audit. Additionally, it is also possible that respondents were simply not aware of available professional development regarding mentoring. Furthermore, it is unknown whether or not the 18 percent of the respondents reporting they had been offered professional development training in mentoring from Iowa State University actually attended.

Nearly half of the respondents (53%) showed interest in receiving professional development training related to mentoring if Iowa State University were to offer it. Faculty were interested in learning the difference between mentoring individuals and groups, how to motivate students to take ownership of what they do, how to assist a student in becoming established in a career, what the expectations are of a mentor and protégé, suggestions on how to help students with setting and attaining goals, and tips on counseling students with academic, financial, and/or personal struggles (e.g. drug and alcohol addiction). Based on the

topics in which respondents were interested in receiving mentoring professional development training, respondents seemed to have some understanding that undergraduate mentoring is more than just academic advising or telling an employee what to do. These topics indicated these respondents were interested in improving their mentoring skills in order to benefit students.

Respondents also gave suggestions for the delivery of professional development programs related to undergraduate mentoring. They proposed organizing two, one hour information-based workshops or seminars. They suggested focusing on mentoring strategies and resources and having experienced mentors speak about the basics of mentoring. It was also requested that a list of contacts for dealing with problems outside of faculty expertise (e.g. counseling, safety issues, etc.) be developed. These recommendations indicated that time is a major factor and should be considered in the construction of mentoring professional development programs. The suggestions also indicated that faculty value information and advice from professionals with experience. Though John Dewey (1938) would argue that your experience is your best teacher, it's also important to learn from the experiences, mistakes and successes of others (Bransford et al., 2000). Encouraging collaboration among faculty and other mentors should be considered in professional development training.

CHAPTER VI. SUMMARY, CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS

Summary

The purpose of this study was to determine the perceptions of the faculty in the College of Agriculture at Iowa State University regarding the undergraduate mentoring process. The study sought to determine the mentoring functions practiced by faculty and to what extent they were practicing these mentoring functions. The objectives of the study were to:

1. Describe demographic characteristics of the faculty participants.
2. Determine faculty perceptions about mentoring.
3. Determine the mentoring functions practiced and the extent to which they are practiced by faculty in the College of Agriculture.
4. Compare the mentoring functions practiced among selected demographic variables.

The study utilized a descriptive survey research design. The accessible population consisted of 378 faculty members in the College of Agriculture at Iowa State University. A web-based survey designed using SurveyMonkey (1999) was used to collect data for this study. The survey instrument consisted of four major sections related to the study's objectives. Dillman's (2000) pre-testing approach was used to determine content and face validity of the instrument. The Cronbach's Alpha reliability coefficients were .74 and .89 for the Perceptions of Mentoring and Extent of Mentoring Practiced sections of the questionnaire, revealing that the instrument was adequate and reliable for the study.

The survey instrument was sent to 378 faculty members and a total of 200 useable questionnaires were returned for a response rate of 53.7%. Raw data provided by

SurveyMonkey were entered into an Excel spreadsheet and imported into Statistical Analysis Software (SAS Windows 9.1). Descriptive statistics such as means, standard deviations, frequencies and percentages were used to analyze the data. Inferential statistics such as t-tests and Analysis of Variance (ANOVA) tests were used to determine differences among selected groups.

Major Findings

Demographics revealed that the majority of respondents were Full Professors, Associate Professors, and Assistant Professors and were predominately from the departments of Agronomy and Animal Science. Respondents' primary responsibility area was research. The mean age of respondents was 49.9 years, and the average years employed by Iowa State University was 15.4 years. Undergraduate student employees and advisees were the groups that respondents believed they primarily mentored. The respondents reported that on average, they spent 9.12 hours interacting with students per week, and actually mentored students for approximately five hours per week.

Respondents perceived that the mentoring process is systematic and involves counseling and assisting a protégé with career development and goal setting. However, the respondents were undecided if the mentoring process involved friendship or if mentors served as an advocate or sponsor to a protégé. Respondents were also unsure who should lead the mentoring process – the mentor or the protégé.

Respondents were asked to provide their own definition of undergraduate mentoring. In the 126 definitions provided, a variety of terms and phrases were used to define undergraduate mentoring. The terms and phrases used were both similar to and different from mentoring definitions found in mentoring literature. The three terms/phrases that appeared

most frequently in respondents' definitions were: guide/guiding/guidance, personal, academic, and career/professional development, and career development. Teaching was used only once to define undergraduate mentoring. Ultimately, every definition had a different way of describing mentoring.

Overall composite scores of each mentor function indicated that faculty members who responded to the questionnaire practiced the functions *often*. Actual composite scores revealed that faculty were practicing the role modeling function most often and the direct assistance function least often. Analysis of variance (ANOVA) tests revealed that there were no statistically significant differences in the practice of the six mentoring functions across faculty titles, ages, responsibility areas, or departmental affiliations.

The majority of the respondents reported that they had not had any formal training in mentoring and only 18.2% of the respondents reported they had been offered professional development related to mentoring while employed by Iowa State University. Over half of the respondents were interested in receiving professional development related to mentoring if it were offered by Iowa State University. Respondents also provided suggestions for specific topics they were interested in learning about, along with suggestions for the delivery of mentoring professional development.

Conclusions

The following conclusions were drawn based on the findings as they relate to the perceptions of the 2006 College of Agriculture faculty at Iowa State University and the review of mentoring literature.

1. Based on mentoring literature and the respondents' perceptions of the concept of mentoring and the mentoring process, the study showed that respondents appeared to

be somewhat unfamiliar with the complete mentoring process per se, even though they exhibited many of its functions.

2. Due to partial consistency with the definitions found in mentoring literature, the undergraduate mentoring definitions provided by some respondents in this study indicated that a few faculty members understood to some extent what undergraduate mentoring entails.
3. The plethora of terms and phrases used to define mentors or mentoring continues to make arriving at a single, precise definition of mentoring a difficult task.
4. According to the literature and the overall mentor function composite scores of this study, respondents appeared to be practicing the six mentoring functions as presented in the Brzoska et al. (1987) Mentor Function Model.
5. Results revealed tremendous consistency existed among the mentoring functions practiced by the respondents based on faculty title, age, responsibility area, and departmental affiliation.
6. Though the respondents reported they were practicing the mentoring functions *often*, they may have been unaware of the linkages between their perceptions of mentoring and their mentoring behaviors. Likewise, it is possible the respondents did not understand the significance of the mentoring functions.
7. The study provided evidence that the respondents may have been confusing their roles as an academic advisor or teacher with the role of a mentor.
8. The respondents believed that professional development training relating to undergraduate mentoring is important and were interested in receiving training if it were offered by Iowa State University.

Recommendations

The following recommendations were made based on the findings of this study:

1. To educate faculty on undergraduate mentoring, training or professional development programs or workshops should be designed addressing the following concepts:
    a. Introduce faculty to the Brzoska et al. (1987) Mentor Function Model. Explain why the six functions should be used in undergraduate mentoring, and provide examples or demonstrate how to perform each function.
    b. Explain that mentoring relationships are not only beneficial to the protégé, but also to the mentor.
    c. Illustrate to faculty how the informal contact (friendship) function of mentoring can be properly incorporated into their relationship with a protégé.
    d. Explain how a mentor can be a sponsor and an advocate to a protégé.
    e. Discuss advantages and disadvantages of formal and informal mentoring relationships or of assigned mentors and chosen mentors.
    f. Discuss differences and similarities between undergraduate mentoring and academic advising.
2. To increase faculty's metacognition related to undergraduate mentoring, faculty members should be encouraged to reflect frequently about their mentoring experiences through interaction with other faculty. This might aid faculty in distinguishing the difference between interaction with students, academic advising, and mentoring functions.
3. Since a common definition of mentoring cannot be agreed upon, the College of Agriculture and its faculty should create a shared vision of mentoring. Individuals in a

mentoring relationship should also work together to create a mutual definition that is appropriate for their relationship.

Further Research

The following recommendations for further research are offered based on the findings of this study:

1. Students in the College of Agriculture at Iowa State University should be surveyed to determine their perceptions of the mentoring process practiced by the faculty. Student perceptions of the mentoring practiced by faculty could reveal that faculty mentors are not practicing mentoring as well as they think.
2. A similar study should be conducted in Colleges of Agriculture at other universities, as well as at other colleges and departments at Iowa State University. This could validate the findings of this study and might possibly result in determining universal mentoring roles. Furthermore, this would bring about different issues and needs related to undergraduate mentoring that should be addressed. It is recommended that researchers obtain an accurate list of faculty and ask if undergraduate student interaction occurs. It should not be assumed that faculty work only with undergraduates.
3. Undergraduate mentoring definitions from faculty members in other colleges and universities should be studied. Perhaps faculty in the College of Business are defining undergraduate mentoring differently than faculty in the College of Engineering. Above all, such findings would help determine if the definitions and terms used are consistent with previous definitions used in mentoring literature.

4. More research is needed on faculty perceptions of the differences and similarities between academic advising and mentoring. Specific roles of academic advisors and mentors should be identified and compared.
5. The types of professional development or training in undergraduate mentoring that are offered to faculty at various universities and colleges should be reviewed. Findings could lead to the discovery of the best methods for providing professional development related to undergraduate mentoring. A study comparing faculty members who have had formal mentoring training or professional development to those who have not, should also be conducted. Such a study would aid in further evaluation of the materials presented in mentoring workshops.
6. A qualitative research study could address what specific actions and behaviors performed by faculty are considered mentoring and why. Identifying specific actions or behaviors that faculty believe signify a specific mentoring function would assist in more awareness of faculty's understanding of mentoring.

Implications and Educational Significance

Implications of this study can be drawn from relating mentoring and its involvement in the learning process, especially in experiential learning and agricultural education. John Dewey (1938), often referred to as the father of experiential learning, would argue that one's experience is the best teacher. However, it is impossible for one to learn everything in this world alone. Thus, mentoring as it relates to experiential learning is like vacuuming – if the floor isn't dirty, there is nothing to collect. This metaphor implies that the influence of a mentor is a critical factor in learning.

Therefore, all faculty members serving as mentors in mentoring programs, such as Science With Practice at Iowa State University, have the opportunity to enhance the experiential learning process for undergraduate students by being a mentor; initiating and facilitating learning experiences. Unfortunately, if faculty do not have an adequate understanding of the mentoring process in order to provide sufficient mentoring activities, student learning may be hindered. Therefore, academic departments at Iowa State University can benefit by addressing the findings and recommendations of this study in the development and delivery of undergraduate mentoring training workshops or faculty seminars. Further, other colleges and universities should investigate the consistency of the mentoring practices modeled at Iowa State University to augment their own teaching and learning practices.

Coordinators of formal mentoring programs, such as Science With Practice, can also benefit from the findings of this study by educating participating faculty mentors on how to appropriately mentor student protégés. Properly educating faculty about the relationship between the mentoring process and experiential learning might influence the way they mentor, and ultimately result in greater student academic achievement and career development.

Additionally, agricultural educators and Science With Practice faculty mentors should consider adopting the model used in this study. The functions presented in the model offer excellent strategies for providing experiential learning environments for students. This study's model incorporated learning facilitation by combining principles of education with Kram's (1985) career and psychosocial mentoring functions. For example, faculty mentors in Science With Practice can promote learning by providing their protégés with challenging assignments, coaching them on educational activities and projects, or sponsoring them for

special educational or career opportunities. Through mentoring, students may become more aware of their learning process. With a mentor's help, a student can begin understanding why a certain procedure is performed, rather than only knowing how to perform the procedure.

Furthermore, the results of this study not only provide an opportunity for the model to be adapted to the undergraduate mentoring process, but also to secondary education. Specifically, secondary agricultural education instructors can apply the mentor functions presented in the model when managing their students' Supervised Agricultural Experience (SAE) programs. For example, the instructor can apply strategies from the observation and feedback function during SAE visits. Likewise, an FFA advisor's appropriate understanding and practice of the role modeling or demonstration functions may be incorporated into the agriculture curriculum.

APPENDIX A. SURVEY INSTRUMENT

2006 Iowa State University College of Agriculture Undergraduate Mentoring Questionnaire

Contact Information:

Ashley Stull
Graduate Student
223 Curtiss Hall
ajstull@iastate.edu
(515) 292-2217

Dr. Robert Martin
Professor & Head
201 Curtiss Hall
drmartin@iastate.edu
(515) 294-0896

Code: _____

2006 COA Mentors **Introduction**

Thank you for volunteering to participate in this study. The purposes of this study are to 1) identify how faculty members in the Iowa State University College of Agriculture perceive the undergraduate mentoring process, and 2) to determine what specific mentoring functions are being practiced while working with undergraduate students.

Please follow the instructions for each section as you complete the questionnaire. Your participation should take approximately 15 minutes. Once your questionnaire is submitted your name will be deleted from the mailing list and never connected to your responses in any way. Your participation is completely voluntary, and you may decline participation at any time.

2006 COA Mentors **SECTION 1: Perceptions of Mentoring**

1. Using the following scale: Strongly disagree (SD), Disagree (D), Neutral (N), Agree (A), or Strongly agree (SA), please read each statement and identify the extent to which you agree by placing an X in the corresponding box.

	SD	D	N	A	SA
Mentoring is a systematic process.					
Mentoring is a skill that requires training.					
Mentoring is the same as academic advising.					
Mentors that are chosen are more effective than assigned mentors.					
Mentoring is a casual, laid back process of giving advice.					
Mentors should be active not passive.					
The best mentors are directive in the process.					
The protégé should lead the mentoring process.					
Mentors have a greater intellectual status than protégés.					
Mentoring is a relationship between an older, more experienced person and younger, inexperienced person.					
Mentors play many roles.					
Mentoring consists of frequent informal conferences.					
Mentoring is based on friendship.					
Mentoring is a socialization process.					
A mentor assists the protégé in developing a sense of professional identity.					
A mentor is a role-specific model in the discipline.					
A mentor serves as an advocate for the protégé.					
Mentoring involves counseling a protégé.					
A mentor is an information source.					
Mentors demonstrate exemplary job skills.					
A mentor demonstrates strategies for accomplishing goals.					
A mentor observes protégé performance.					
Mentoring is a process involving an exchange of information.					
Mentoring is career development assistance.					
A mentor serves as a sponsor to a protégé.					

2006 COA Mentors **SECTION 2: Extent of Mentoring Practiced**

2. Using the following scale: Never (N), Sometimes (S), Often (O), Always (A), please read and respond to each statement regarding your mentoring practices by placing an X in the corresponding box.

As a mentor I...	N	S	O	A
am available outside of working hours for help.				
am easy to approach when my students have questions.				
show interest in my students' activities outside of work (e.g. academics, extra curricular activities, etc.).				
interact with my students socially outside of work.				
keep feelings and doubts my students have shared with me in strict confidence.				
display professionalism while on the job.				
demonstrate realistic ways of solving problems.				
exhibit commitment to my students' educational/career growth and development.				
model the work behavior I expect my students to imitate.				
believe my students will strive to be like me if they obtain a similar career.				
help my students meet new colleagues in the department.				
give my students responsibilities that increase personal contact with other individuals on and off campus.				
share personal experiences as an alternative perspective to my students' problems.				
encourage my students to talk openly about anxiety and fears that detract from their work.				
convey empathy for the concerns my students have discussed with me.				
demonstrate effective listening skills in conversations with my students.				
share history of my career with my students.				
share ideas with my students about their projects.				
suggest specific strategies for accomplishing project goals.				
encourage my students to prepare for career advancement.				
provide suggestions concerning current problems my students encounter.				
encourage my students to explore alternatives rather than just providing solutions.				
convey feelings of respect for my students as an individual.				
encourage my students to try new ways of behaving on the job.				
provide my students with objective feedback by citing specific examples.				

As a mentor I...	N	S	O	A
provide my students with support regarding their performances.				
give assignments to my students that presents opportunities to learn new skills.				
speak highly of my students' abilities and skills to others.				
provide my students with assistance on how to solve problems they may face on the job.				
help my students clarify their career goals.				

2006 COA Mentors **General Mentoring Questions**

3. Please provide *YOUR* definition of undergraduate mentoring.

4. Which of the following undergraduate groups do you mentor? Check all that apply.

- ☐ Student Employee(s)
- ☐ Science With Practice Students
- ☐ Undergraduate Advisees
- ☐ Student Organizations/Clubs
- ☐ Internships
- ☐ Independent Study/Cooperative Education
- ☐ Learning Communities
- ☐ Other (please specify) _____

5. On average, how many hours per week do you interact with your students?

_____ hours

6. How many of the hours reported above would you consider mentoring?

_____ hours

7. Have you had any formal training in mentoring? Please check one.

- ☐ Yes (If yes, describe below.)
- ☐ No

If YES, please describe the training you received.

8. While employed at Iowa State University, have you ever been offered any professional development training related to mentoring? Please check one.

- ☐ Yes
- ☐ No

9. Would you be interested in professional development training relating to mentoring at Iowa State University if it were offered? Please check one.

- ☐ Yes (If yes, describe below.)
- ☐ No

If YES, please list the topics you are most interested in receiving professional development.

10. What is your title? Please check one.

- ☐ Distinguished Professor
- ☐ University Professor
- ☐ Professor
- ☐ Associate Professor
- ☐ Assistant Professor
- ☐ Instructor
- ☐ Lecturer
- ☐ Other (please specify) _____

11. Which department within the COA are you primarily associated? Please check one.

- ☐ Agricultural and Biosystems Engineering
- ☐ Agricultural Education and Studies
- ☐ Agronomy
- ☐ Animal Science
- ☐ Biochemistry, Biophysics and Molecular Biology
- ☐ Ecology, Evolution and Organismal Biology
- ☐ Economics
- ☐ Entomology
- ☐ Food Science and Human Nutrition
- ☐ Genetics Development and Cell Biology
- ☐ Horticulture
- ☐ Natural Resource Ecology and Management
- ☐ Plant Pathology
- ☐ Sociology
- ☐ Statistics

12. Identify your *PRIMARY* responsibility? Please check one.

- ☐ Extension
- ☐ Teaching
- ☐ Research
- ☐ Other (please specify) _____

13. How many years have you been employed at Iowa State University? _____years

14. What is your age? _____years

2006 COA Mentors **Thank you for your time!**

Thank you for completing the questionnaire. We are especially grateful for your participation in the study. With your help, we can better understand the undergraduate mentoring process and the specific mentoring functions being used in the Iowa State University College of Agriculture.

Please return your completed questionnaire in the self-addressed envelope provided through campus mail by **Friday, May 5, 2006** to:

Ashley Stull
223 Curtiss Hall

If you have any questions or are interested in the results of this study, please let us know. We would be glad to talk with you.

Thanks again!

Ashley Stull
Graduate Student
223 Curtiss Hall
ajstull@iastate.edu
(515) 292-2217

Dr. Robert Martin
Professor & Head
201 Curtiss Hall
drmartin@iastate.edu
(515) 294-0896

APPENDIX B. HUMAN SUBJECTS APPROVAL

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office of Research Assurances
Vice Provost for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4566
FAX 515 294-4267

DATE: March 22, 2006

TO: Ashley Stull

FROM: Dianne Anderson, IRB Co-Chair

RE: **IRB ID #** 06-161
STUDY REVIEW DATE: March 21, 2006

The Institutional Review Board has reviewed the project, "Perceptions of Mentoring Functions of Faculty in the College of Agriculture at Iowa State University" requirements of the human subject protections regulations as described in 45 CFR 46.101(b)(2). The applicable exemption category is provided below for your information. Please note that you must submit all research involving human participants for review by the IRB. Only the IRB may make the determination of exemption, even if you conduct a study in the future that is exactly like this study.

The IRB determination of exemption means that this project does not need to meet the requirements from the Department of Health and Human Service (DHHS) regulations for the protection of human subjects, unless required by the IRB. We do, however, urge you to protect the rights of your participants in the same ways that you would if your project was required to follow the regulations. This includes providing relevant information about the research to the participants.

Because your project is exempt, you do not need to submit an application for continuing review. However, you must carry out the research as proposed in the IRB application, including obtaining and documenting (signed) informed consent if you have stated in your application that you will do so or required by the IRB.

Any modification of this research must be submitted to the IRB on a Continuation and/or Modification form, prior to making any changes, to determine if the project still meets the Federal criteria for exemption. If it is determined that exemption is no longer warranted, then an IRB proposal will need to be submitted and approved before proceeding with data collection.

cc: Ag Ed & Studies
Robert Martin
File

ORC 04-21-04

APPENDIX C. CONTACT LETTERS

Pre-notice Letter

Dr. [NAME]

My name is Ashley Stull, and I am a graduate student in Agricultural Education and Studies. In a few days you will be receiving an e-mail message with a survey link requesting you to fill out a questionnaire regarding an important research study being conducted by the Iowa State University Agricultural Education and Studies Department. The study is concerned with undergraduate mentoring practices used by the faculty in the College of Agriculture (COA), as well as perceptions of the undergraduate mentoring process. Participation is estimated to take approximately 15 minutes.

Thank you for the time to briefly inform you about this study. The success of our research depends greatly on generous people like you.

Sincerely,

Ashley Stull
Graduate Student

Robert A. Martin
Professor & Head

If you have any questions about the rights of research subjects or research-related injury, please contact the Office of Research Assurances, 1138 Pearson Hall, (515)-294-4566; austingr@iastate.edu or the Director of Research Assurances, 1138 Pearson Hall, (515)-294-3115; dament@iastate.edu.

First Questionnaire Letter

Dr. [NAME]

The purpose of this e-mail message is to ask for your help in a Master's of Science degree study about undergraduate mentoring in the College of Agriculture (COA) at Iowa State University. This study is an attempt to learn more about undergraduate mentoring and the extent to which specific mentoring functions are practiced by faculty in the COA.

As a faculty member in the COA at Iowa State University, you are invited to participate in this study. Results from this study will provide valuable information about the undergraduate mentoring process and the various mentoring practices being used within the COA.

Your responses will remain anonymous and confidential. After you submit your completed questionnaire, your name will be deleted from the mailing list, and never connected to your responses in any way. Your participation is completely voluntary. If at any time you wish to decline from participating, you may, and your information will not be evaluated. However, we hope you decide to participate by taking a few minutes to complete the questionnaire.

The questionnaire can be found by clicking on this link: [LINK]

Please follow the instructions for each section as you complete the questionnaire. Your participation should take approximately 15 minutes. By submitting a completed questionnaire you are giving consent to participate. If you choose not to participate, please click this link: [LINK] and you will be removed automatically from our mailing list.

If you have any questions, concerns, or comments about this study, I would be glad to talk with you. I can be reached via e-mail at ajstull@iastate.edu. Dr. Robert Martin, my major professor, also may be contacted by phone at 515-294-0896 or by e-mail at drmartin@iastate.edu. Thank you very much for your time and consideration.

Sincerely,

Ashley Stull
Graduate Student

Robert A. Martin
Professor & Head

If you have any questions about the rights of research subjects or research-related injury, please contact the Office of Research Assurances, 1138 Pearson Hall, (515)-294-4566; austingr@iastate.edu or the Director of Research Assurances, 1138 Pearson Hall, (515)-294-3115; dament@iastate.edu.

Reminder Letter

Dr. [NAME]

Recently, you were sent a questionnaire about mentoring used by faculty in the College of Agriculture (COA) at Iowa State University. In an effort to analyze the undergraduate mentoring process in the COA your participation is important. To complete the questionnaire, please click on the following link: [LINK]

Please follow the instructions for each section as you complete the questionnaire. Your participation should take approximately 15 minutes. If you choose not to participate please click on this link: [LINK] and you will be removed automatically from our mailing list.

Please contact us with any questions. My e-mail address is ajstull@iastate.edu. Dr. Robert Martin, my major professor, may also be contacted by phone at 515-294-0896 or by e-mail at drmartin@iastate.edu. Again, thank you for your time and consideration.

Sincerely,

Ashley Stull
Graduate Student

Robert A. Martin
Professor & Head

If you have any questions about the rights of research subjects or research-related injury, please contact the Office of Research Assurances, 1138 Pearson Hall, (515)-294-4566; austingr@iastate.edu or the Director of Research Assurances, 1138 Pearson Hall, (515)-294-3115; dament@iastate.edu.

Replacement Letter

Dr. [NAME]

About a week ago I sent an e-mail message to you with a survey link about undergraduate mentoring. To the best of my knowledge, your responses have not been received. I am writing again to stress the importance of receiving your input. Although I have sent the questionnaire to all faculty in the College of Agriculture, the results are only representative if everyone participates.

Your responses will remain anonymous and confidential. After you submit your completed questionnaire your name will be deleted from the mailing list and never connected to your responses in any way.

The questionnaire can be found by clicking on this link: [LINK]

Please follow the instructions for each section as you complete the questionnaire. Your participation should take approximately 15 minutes. By submitting a completed questionnaire you are giving consent to participate. If you choose not to participate, please click this link [LINK] and you will be removed automatically from our mailing list.

I hope you will complete and submit the questionnaire by the deadline of **Monday, April 24, 2006**. If you have any questions, please feel free to contact me. My e-mail address is ajstull@iastate.edu. Dr. Robert Martin, my major professor, may also be contacted by phone at 515-294-0896 or by e-mail at drmartin@iastate.edu. Again, thank you for your time and consideration.

Sincerely,

Ashley Stull
Graduate Student

Robert A. Martin
Professor & Head

If you have any questions about the rights of research subjects or research-related injury, please contact the Office of Research Assurances, 1138 Pearson Hall, (515)-294-4566; austingr@iastate.edu or the Director of Research Assurances, 1138 Pearson Hall, (515)-294-3115; dament@iastate.edu.

Final Contact Letter

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Department of Agricultural Education and Studies
201 Curtiss Hall
Ames, Iowa 50011-1050
Administration and Graduate Programs 515 294-5872
Undergraduate Programs 515 294-6123
Extension Programs 515 294-6924

April 25, 2006

Dear Dr.

Over the past three weeks I have sent several e-mail messages about an important research study on undergraduate mentoring I am conducting in the College of Agriculture (COA). The purpose of this study is to learn more about the undergraduate mentoring process and the extent to which specific mentoring practices are used by faculty within the COA.

The study is nearing a close, and this is the last chance for you to complete the questionnaire online. To participate electronically, go to the following link:

http://www.surveymonkey.com/s.asp?A=123101228E76533

If you prefer to complete a hard copy, I have enclosed a paper copy of the questionnaire with this letter. Please follow the instructions to complete the questionnaire and return it via campus mail in the enclosed self-addressed envelope by **no later than Friday, May 5, 2006.**

Please follow the instructions for each section as you complete the questionnaire. Your participation should take approximately 15 minutes. By submitting a completed questionnaire you are giving consent to participate. If you choose not to participate, return the blank questionnaire through campus mail in the self-addressed envelope provided, and you will be automatically removed from our mailing list.

Finally, I want to assure you that your responses will remain anonymous and confidential. Your participation is also voluntary and if you wish to decline from participating you may. However, I would appreciate your consideration of the request to participate in this study. Your participation would contribute to a better understanding of the mentoring process at the undergraduate level.

If you have any questions, I can be contacted at ajstull@iastate.edu. You may also contact Dr. Robert Martin, my major professor, by phone at 515-294-0896 or by e-mail at drmartin@iastate.edu.

Thank you very much.

Sincerely,

Ashley Stull
Graduate Student

Dr. Robert A. Martin
Professor & Head

If you have any questions about the rights of research subjects or research-related injury, please contact the Office of Research Assurances, 1138 Pearson Hall, (515)-294-4566; austingr@iastate.edu or the Director of Research Assurances, 1138 Pearson Hall, (515)-294-3115; dament@iastate.edu.

APPENDIX D. T-values of selected variables between respondents and nonrespondents

	Respondents			Nonrespondents			
	Mean	n	SD	Mean	n	t-value	*p*
Perceptions of Mentoring:							
Mentoring is the same as academic advising.	2.07	177	0.84	2.25	20	0.87	0.385
Mentoring is a casual, laid back process of giving advice.	2.26	180	0.83	2.1	20	-0.80	0.424
Mentoring is a process involving an exchange of information.	4.17	179	0.51	4.25	20	0.69	0.492
Mentoring is a systematic process.	3.79	180	0.82	3.65	20	-0.72	0.470
Mentoring Functions (composite scores):							
Informal Contact	2.99	167	0.36	3.05	20	0.71	0.476
Role Modeling	3.26	167	0.41	3.35	20	0.90	0.367
Direct Assistance	2.81	167	0.43	2.78	20	-0.25	0.802

APPENDIX D. continued

	Respondents			Nonrespondents			
	Mean	n	SD	Mean	n	t-value	*p*
Demonstration	3.17	167	0.46	3.15	20	-0.21	0.837
Observation and Feedback	3.06	167	0.37	2.93	20	-1.5	0.136
Assistance with Professional Development	2.98	167	0.40	3.12	20	1.42	0.158
General Questions:							
One average, how many hours per week do you interact with your students?	8.81	162	7.89	11.63	20	1.50	0.135
How many of the hours reported above would you consider mentoring?	4.88	161	6.37	5.68	20	0.53	0.595
Demographics:							
How many years have you been employed at Iowa State University?	14.87	163	10.68	19.38	20	1.78	0.076
What is your age?	49.71	163	8.84	50.92	20	0.46	0.644

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